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PAGE

The Museum of the American Indian, Heye Foundation. By George H. Pepper. (1 diagr., 9 photos) 401

Geographic Influences in British Elections. By Edward Krehbiel (2 text-maps; 1 colored map and key as inserts) 419

The Churchill River. By Frederick J. Alcock. (1 map, 10 photos) . . 433

The Early Relations between Newfoundland and the Channel Islands. By H. W. Le Messurier. (1 map) 449

Our Immigrant Problem: A Discussion and Review. By Ellsworth Huntington 458

Geographical Record 464

American Geographical Society

Monthly Meeting of November 464

North America

Conservation of Bird Life in North America 464
The Correct Name of Lassen Peak 464
Fog and Water Supply in California 465
Revival of Iron Mining in the Adirondacks 465

South America

A New Theory of the Origin of the Chilean Nitrate Deposits 465
Professor Bingham's Peruvian Expedition of 1915 466
New Expedition of Dr. Hamilton Rice to the Northwestern Amazon Basin . 467
Japanese Labor for Brazil 467
New Steamship Service between Argentina and Bolivia 467

Europe

Italy and the Adriatic 467
Has Climate "Changed" within Historic Times in Europe? 468
The Southwesternmost Black Soils of Europe 468
The Export of Newfoundland Herrings to France 469

Asia

Rainfall of China 469
Railroads in Siam 469
Two Siberian Expeditions 470

Polar Regions

Survey of the Newly Discovered Land by Stefansson 470
Present Condition of the Crocker Land Expedition 471

Oceans

The Drift of Mines at Sea 471

World as a Whole and Larger Parts

Proposed New Railroads in the Russian Empire 472
Rainfall Correlation between North and South America 473

Physical Geography

A New Experiment on the Strength of the Earth's Crust 473
"Sleet" 473

Geographical News

Captain Amundsen's Visit to This Country 473
Personal 474
Obituary 474

Geographical Publications (Reviews and Titles of Books, Papers, and Maps) 475

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THE
GEOGRAPHICAL REVIEW

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THE MUSEUM OF THE AMERICAN INDIAN, HEYE FOUNDATION

By GEORGE H. PEPPER

How old is the American Indian? Whence came he and when? Is he an immigrant whose ancestors first saw the light of day in some far-distant land or is he indigenous to the western hemisphere? These oft-repeated questions have been puzzling geographers and anthropologists since first Columbus set foot upon the new land that was destined to present so many problems for the savants of the eastern world. Years of research and the expenditure of untold thousands have brought us to the realization that the origin of the American Indian is still as great a problem as it ever was and will no doubt claim the attention of scientific investigators for many years to come.

That the history of our primitive races may receive the attention that it deserves and that the proper facilities for the study of American anthropology may be presented to the scientist and general student in the proper way, a new institution has been founded, unique in the annals of anthropological work in this country, whose object will be the preservation of everything pertaining to our American tribes. It will be American preeminently, excluding everything that pertains to foreign peoples and claiming as its own naught but the productions of primitive man in the two Americas. This new stimulus to American anthropological studies is the Museum of the American Indian, Heye Foundation. The institution, fathered by George G. Heye of New York City, embodies the hopes and plans of years of active work and will contain not merely collections of primitive art and utilitarian productions but everything that will be of value to the student who is endeavoring to add something to the general knowledge of the American Indian.

The corner-stone of the new museum was laid on Wednesday, November 8th, at Broadway and 155th Street, in the square now partly occupied by the Hispanic Society of America, the American Geographical Society, and the American Numismatic Society. It will be remembered that in this

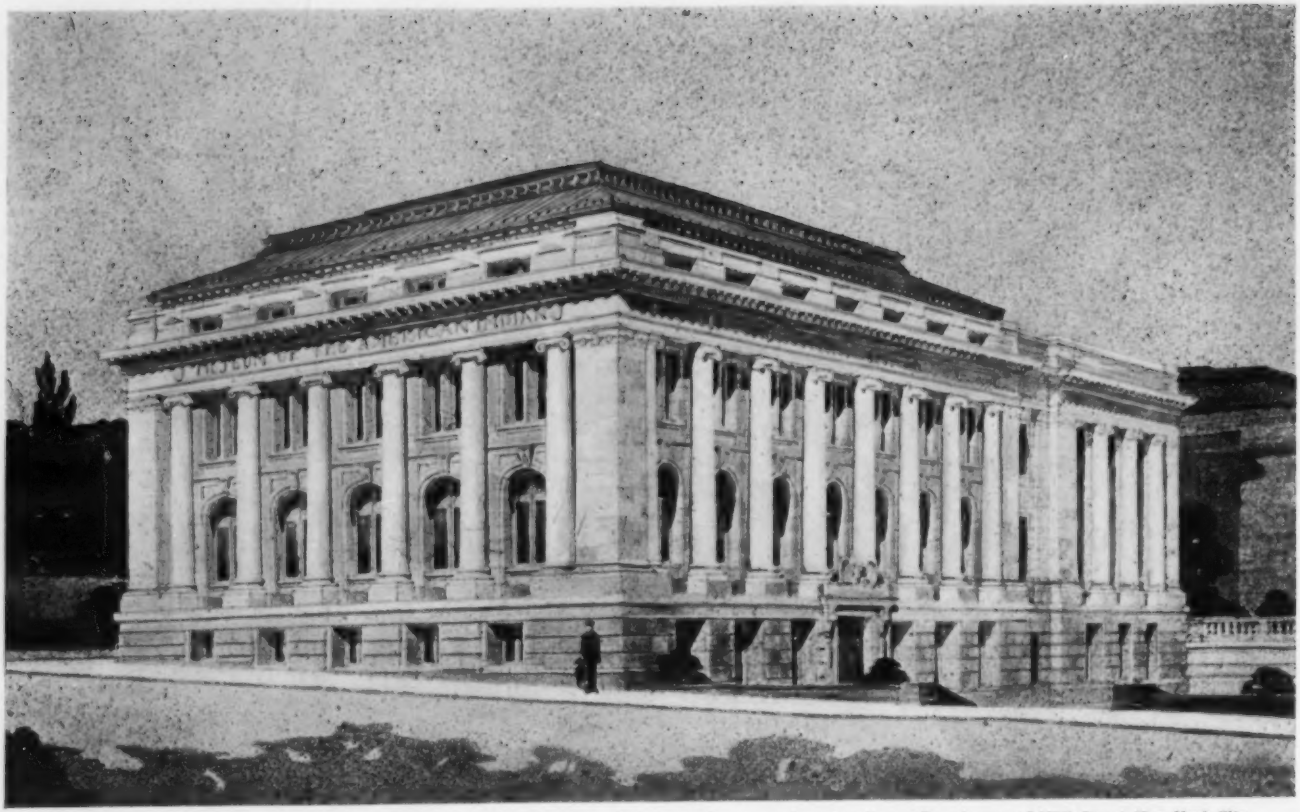

FIG. 1—New building of the Museum of the American Indian, Heye Foundation, now in course of construction at Broadway and 155th Street, New York City.

square will be located the future home of the American Academy of Arts and Letters and the American Institute of Arts and Letters. The Museum of the American Indian will be especially interesting to the Fellows of the American Geographical Society because of the close relations between geographic environment and the culture and distribution of primitive man. The two institutions will work in a spirit of hearty co-operation, and their exhibition halls, practically adjacent, will be visited by thousands from every part of the country.

As perspective is required to present the history of this great undertaking in its proper light we must go back to the time, a decade and a half ago, when Mr. Heye became interested in the problem of the American Indian. His novitiate was of short duration, for it soon became apparent

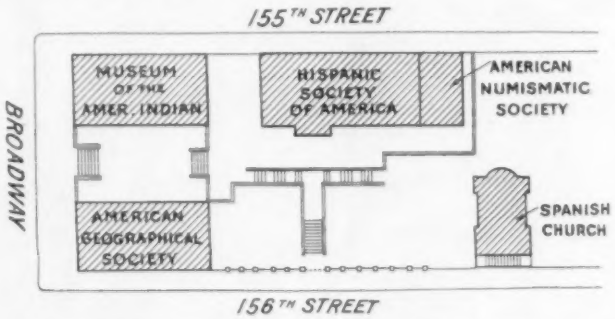

FIG. 2—Plan showing the location of the Museum of the American Indian, Heye Foundation, now under construction, with reference to the American Geographical Society and the other institutions at Broadway between 155th and 156th Streets, New York City.

that systematic collecting, scientific recording, and untiring efforts in preservation of specimens were the three prerequisites of success. Numerous museums were visited and methods of preparation of specimens and catalogs were studied. In 1903 the first large collection was purchased. This was the Henry E. Hales collection of prehistoric Pueblo pottery and other material from the ruins in Socorro County, New Mexico. It was shortly after the purchase of this collection that the writer became associated with Mr. Heye and during the summer of 1904 obtained for him his second large addition, a collection of pottery vessels from the St. Johns region of Arizona. These two accumulations of Pueblo material form the real nucleus of the Heye collection. From the first, catalog entries were made on two sets of cards, the individual sets being kept in different buildings, thereby insuring the data against loss by fire. Throughout the development of the project of making a collection along the most approved scientific lines, one idea was dominant—the bringing together of material, not for personal gain or the mere gratification of a personal hobby but for the use of students in their studies of the artifacts of our primitive peoples.

FIG. 3.

FIG. 4.

FIG. 3—Panoramic view of Cerro de Hojas, Manabi, Ecuador. These Andean foothills were terraced by the aborigines, and on these terraces their houses were built.
FIG. 4—River bottom near Canton, N. C., showing two prehistoric Indian mounds. The one in the right foreground was explored by one of the Museum expeditions.

The work of the new museum will not be confined to the exhibition of material. One of the main features will be the study collection, consisting of large series of specimens so arranged that they can be utilized to advantage. This has long been the dream of museum curators, and many students and collectors have felt the need of collections so arranged that they could obtain the needed information through personal study of the objects. Thus science and education will go hand in hand, and it will be the aim of those interested in the museum work to instil in the popular mind the necessity of preserving all objects of Indian origin, especially those of a perishable nature.

The story of the American Indian north of Mexico in the early days before the advent of the alien was, until comparatively recent times, shrouded in mystery. Having no written language, he left no records that can be woven into a consecutive story. Pictographs there are in abundance, but most of them are similar to the crude attempts of children in the delineation of some personal adventure. The years that have passed since the time of the Conquest have witnessed the natural decay and disintegration of the perishable objects that were then in use. In many cases, especially in the central part of the United States and in Canada, the Indians placed their dead in the open, and, though their prized possessions were deposited with them, the passing years have left but few vestiges of costumes, objects of wood, or other artifacts that would tell so much of the habits, ceremonies, and home life of those who used them. Furthermore, in certain parts of America cremation not only of the bodies but of vast masses of objects was practiced. For the last hundred years the rapid colonization and development of great sections of the New World have resulted in the destruction of cemeteries, mounds, and other aboriginal burial-places.

In a few instances nature has exhibited a kindlier mood, and in the fastnesses of caves has preserved rare woven fabrics and other materials of an esthetic and utilitarian nature. The atmospheric conditions prevailing in some of the caves in Utah, Colorado, New Mexico, Arizona, and northern Mexico have caused the desiccation of practically all of the organic matter therein contained. Human tissues have undergone a natural drying process which has mummified the bodies, in a natural way, as perfectly as did the elaborate mummifying processes of the ancient Egyptians. From these caves and from certain others in Kentucky and Oklahoma much material of a highly enlightening nature has been obtained, but nothing to show that their inhabitants had reached that cultural horizon that marks the beginning of written records. The dry and arid soil and the general conditions prevailing along the Peruvian coast have preserved, in the *huacas*, practically everything that would exhibit native utilitarian and artistic products. Here, however, the very wealth of material has attracted the ruthless search of the treasure seeker, resulting in the practical destruction of much that the student needs for reconstructing the life history of the

Fig. 4—River bottom near Canton, N. C., showing two prehistoric Indian mounds. The one in the right foreground was

ancient people. One other region is to be found in America where nature has assisted in the preservation of the remains. This is in the great northwestern section of Argentina. Outside of these localities, owing to the disintegration of perishable artifacts, the story of archeology must remain decidedly incomplete. In Mexico the Spaniards found a culture that was more highly developed than the cultures that existed north of the Rio Grande. Painted records had been used perhaps for centuries before the landing of the old conquistadors. Ideographic records of conquests, astronomical and astrological observations, and of general events in the lives of the people were depicted on deerskin or maguey fiber. These "codices," some of which retain the annotations made by the early padres, with the elaborately carved records on stelae and other stone monuments, have proved to be of wonderful value in the study of Mexican archeology, but consecutive records, histories, poems, rituals, such as are recorded on the cylinders of Babylon or on the papyri of the Egyptians, do not exist in the New World, and, having no such heritage, the student must evolve the story of the various prehistoric tribes from what they have left behind them. Hence the need of continued scientific study of the glyphs and codices of Mexico and Central America and the investigation of the mounds, the caves, the middens, and other places wherein may be found objects that may add to our knowledge. The interrelation of objects may prove of prime importance in the determination of the use to which they were put by the particular people of the region, and it is this gathering and correlation of facts that will enable our investigators, through analogy, to arrive at definite conclusions and thus prepare for the historian the skeletal frame upon which the life history of our aborigines may be built.

Field Expeditions

The first actual field collecting was begun in 1904, when Mr. Frank D. Utley visited Porto Rico in the interest of Mr. Heye. He succeeded in obtaining a wooden *duho*, or seat, several stone collars, a number of petaloid celts, and other stone implements. During the same year the writer carried on exploration work in the *yacatas*, or mounds, of the *tierra caliente* of Michoacan, Mexico, where many pottery vessels and other objects were found associated with the burials. In 1905, Mr. Utley collected in Panama and Costa Rica, but the first comprehensive plans for extended exploration work were not formulated until 1906. At that time Prof. Marshall H. Saville of Columbia University planned and commenced this work. It had for its object an exhaustive survey of a certain portion of the Andean and coast regions of the northwestern portion of South America, beginning with the southernmost limits of Ecuador and extending northward to the Isthmus of Panama. A continuation of the work was planned to include the northern and northeastern parts of South America and the islands of the West Indies.

FIG. 5.

FIG. 6.

FIG. 5—Modern native bamboo house on Cerro Jaboncillo, province of Manabi, Ecuador. Judging from the prehistoric house enclosures, it would seem that in ancient times this was the prevailing type of house.

FIG. 6—Prehistoric stone seat found on a house site on Cerro Jaboncillo near the town of Monte Cristi, province of Manabi, Ecuador.

In 1906 Professor Saville, accompanied by Mr. Foster H. Saville, carried on investigations in Ecuador in the province of Manabi and in the interior valleys of the Andes near Riobamba. Owing to the unexpected richness of the Ecuadorian field the first plan, namely, the making of a reconnaissance of Ecuador and Colombia, was abandoned, and Mr. Heye decided to devote funds for a more thorough survey of the field.

In 1907 the second expedition, consisting of two parties, was sent to Ecuador. The first party, consisting of Foster H. Saville and Lewis W. Niendorff, was sent out in February in order to complete the collecting work begun the year before. Later they went to the vicinity of Ambato, where large and representative collections were obtained. In May the second party, consisting of Professor Saville and the writer, went to Manabi. At this time Mr. Niendorff was sent to the Island of Puna, while the other three members of the expedition carried on the work of exploration in Manabi. In August Professor Saville and Mr. Niendorff went to the province of Esmeraldas, where investigations were carried on; thirty-five locations were visited and large collections were obtained, excavations being carried on in several places.

In 1908 the third expedition visited the coast of Ecuador. Professor Saville was assisted by the American Consular Agent at Esmeraldas, Mr. George D. Hedian. During this season general work was carried on in the province of Manabi in the vicinity of the equator.

In 1910 the fourth Ecuadorian expedition carried on explorations in the interior, especially in the provinces of Bolivar, Léon, Pichincha, Imbabura, and Carchi, the work of the expedition ending at the Colombian frontier. On this trip Professor Saville had four assistants, among whom was Señor Manuel Gamio, the present Inspector of Ancient Monuments in Mexico. Since that time Professor Saville has made another trip to Esmeraldas, and in 1914, accompanied by Foster H. Saville and Randolph M. Saville as assistants, spent a season in exploring mounds and village sites in the municipality of Tumaco, Colombia, along the southern section of the Colombian coast. In 1916 the work of completing this survey of the coast of Colombia along the Ecuadorian frontier was accomplished. So far as Ecuador is concerned there remain to be investigated but the southern provinces that adjoin the frontier of Peru.

All of these researches were purely archeological. In the coast region of northern Ecuador is the only tribe of pure-blood Indians at present living on the coast. They inhabit the region near the Rio Santiago and form part of a former numerous people known for many years as the Yumbos. These are true Cayapa Indians, and a study of this tribe was deemed an essential part of this investigation in order to ascertain if any traditions remained which might throw light on the antiquities of the coast. Dr. S. A. Barrett was sent to the field in 1908 and 1909 to investigate the habits, customs, and language of the Cayapa, and his report is now ready for the press.

In 1915 Professor Saville and Randolph M. Saville made a reconnaissance in the Department of Cortez, Honduras. An examination was made of the archeological conditions along the Ulua River, and an important collection of antiquities was brought together illustrating the complex features of this section of Central America, objects of several well-known and far-distant cultures being found in the restricted area of the broad valley in which flow both the Ulua and Chamelecon Rivers.

As a result of this continued and consistent work the Museum possesses the only comprehensive collection from Ecuador that has ever been brought together. The interior has furnished large series of pottery vessels, including a wonderful lot of mortuary jars that were found in the *huacas* of Angel in the province of Carchi. These *huacas,* or well-like tombs, were discovered by the natives, who in some way ascertained that gold had been buried by the older peoples with the bodies. The entire town moved to the ridges that contained these *huacas,* and systematic grave robbery was carried on. They found many gold ornaments, which were melted as soon as taken out, also the symmetrical jars before mentioned. Many of these vessels were preserved and may now be seen in the temporary home of the Museum at 10 East 33rd Street, New York City. Stone, bone, and metal objects and ornaments were found in abundance in many parts of the regions visited by the expedition.

During the second season, 1907, the writer was in charge of the excavation work near Manta in the province of Manabi. The Andean foothills near this town were dotted with house sites which contained numerous stone carvings, the most noteworthy being the stone seats, most of which are supported on the backs of human or animal figures. Of the sixty-five seats that were found a few are quite small, but many are very heavy: one specimen weighs over 300 pounds. Two large burial mounds were explored, one of which, according to a local tradition, had on its summit a large stone table encircled by a ring of these seats. Fragments of seats were found at the base of one of the mounds, but none was encountered beneath the surface, and there were no evidences of the presence of the stone table, the greater part of the objects found with the burials being pottery vessels.

On the coast of the province of Esmeraldas many pottery vessels and gold and platinum ornaments have been found. The gold is of particular interest, as the individual pieces are in the form of filigree or other forms of delicate techniques. Included in the gold material from Ecuador is a large crown that was found in a tomb in Sigsig, province of Azuay; some of the objects found with it, including a throwing stick incrusted with gold, were destroyed by the natives who found them, but many of the accompanying objects were rescued.

Near the coast town of Atacames, province of Esmeraldas, burials of a peculiar nature were found by Professor Saville; they were in large cylindrical pottery tubes which had been superimposed to form a *huaca.* These

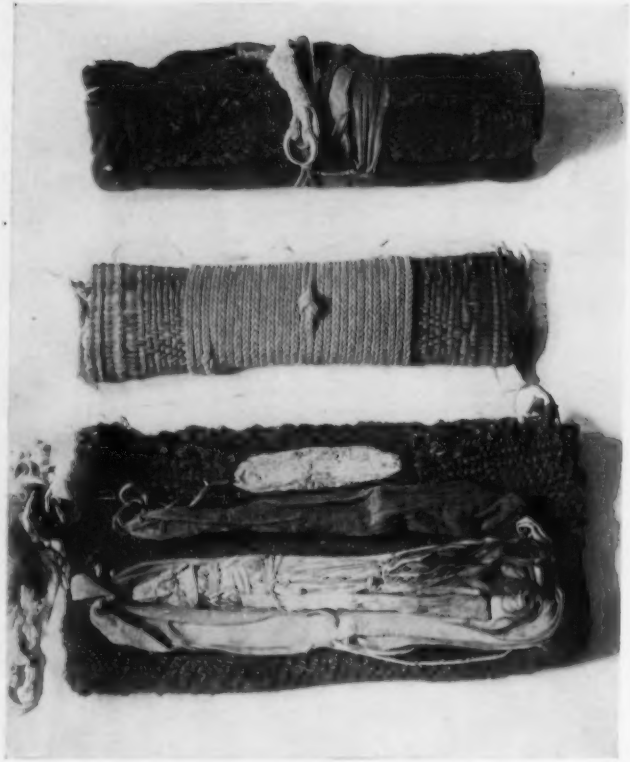

FIG. 7.

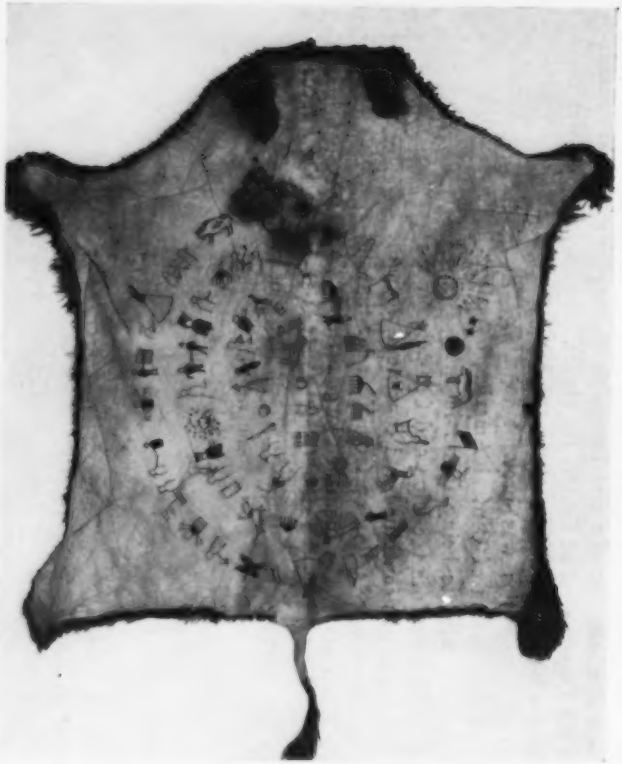

FIG. 8.

FIG. 7—Osage scalp bundles. The upper one is complete. The other has been opened and shows the rush bag wrapped with braided buckskin, also the contents of the bundle, including the "scalp bird."

FIG. 8—Painted buffalo robe of the Sioux Indians. This particular record is known as "Lone Dog's winter count" and is a record of events typifying years from 1800-01 to 1870-71. It starts with the middle figure, which means thirty Sioux were killed by the Crow Indians; the last year, shown in the upper right hand corner, records the death of fourteen Sioux in battle with the Crows. Thus the principal event of each year stands for the year itself.

prehistoric people had no doubt migrated from the interior, where they had been accustomed to carve their *huacas* in the solid rock; finding conditions unsuited to such work they produced a substitute by lining a hole with the tubes. In one of these was found a skull containing teeth that had been inlaid with bands of gold and in another a jaw having circular gold inlays in the teeth. This ornamentation was done for purely ceremonial purposes or for adornment and is a wonderful example of pre-Columbian dentistry. These specimens are now in the Museum collection.

Two large volumes and several monographs concerning the work in this region have been published,[1] and others are in press.

In 1907 a general archeological survey of the West Indies was begun. The Rev. Thomas Huckerby of the island of St. Vincent was entrusted with the work of collecting the scattered material that is found in such abundance on this island. Since then he has extended his field of operations to Tobago, Trinidad, Grenada, Carriacou, Cannouan, and many of the other islands of the Lesser Antilles and of the Windward Islands. He is still engaged in this most important work, and through his efforts the Museum now has an archeological collection from these islands that is second to none. The wide range of axe and celt forms from St. Vincent and Grenada, especially the ceremonial types of the former class of implements, presents an exhaustive series for the study of the evolution of animal and other forms. Of still greater interest to the student is a series of both well-known and fantastic objects made from a metamorphosed volcanic scoria. There are several hundred specimens, all of which were found in a restricted area near Fancy at the base of the volcano of La Soufrière. Nothing like them has been found in the adjacent islands, and it is quite probable that they were made and deposited at this place as votive offerings in way of propitiation to the god of the volcano.

Mr. Theodoor de Booy of the Museum staff started his West Indian investigations in the islands of the Bahamas, especially those included in the Caicos group. Among the few prehistoric implements from these parts is a monolithic axe, and in one of the caves a perfectly preserved Lucayan paddle was found. It is fashioned from a piece of cedar and is the first one that has been recorded as having come from the West Indies. Evidencing as it does the form of paddle in use by the natives before the time of Columbus it is of special interest to the layman as well as to the student. The kitchen-middens of Jamaica, the caves in the eastern part of Cuba, the caves and middens of Santo Domingo, the village sites of Trinidad and of the Dutch islands of Oruba, Curaçoa, and Buen Ayre, near the coast of Venezuela, all have received the attention of this investigator, and many new forms and unique specimens have been added to the collections as a result of these explorations. One pottery figure from a cave in Santo

[1] See footnote 3, below.

Domingo is in the form of a hunchbacked man and is represented in a sitting posture. Originally it was no doubt seated on a stool, but no evidence of its remains was found in the cave. So far as known it is unique; the only similar specimen being one that was found in Santo Domingo and sent to Europe.

Dr. J. Walter Fewkes of the Bureau of American Ethnology in Washington, D.C., who has made a special study of West Indian cultures, visited St. Vincent in the interest of the Museum. He also visited many of the smaller islands and carried on explorations on the island of Trinidad. In the kitchen-middens of Erin Bay, Trinidad, he found pottery vessels and other objects, representative of the prehistoric culture of the island, that throw a new light on this particular area and the environmental influences that have affected it.

The archeology of the island of Cuba was practically unknown until Mr. M. Raymond Harrington, following Mr. De Booy's preliminary survey, began his investigations in the caves and middens of the Baracoa region on the east coast of the island. Pottery vessels, which at that time were represented by only a few specimens in the museums of this country, were found in great numbers, many of them being in a perfect state of preservation. These, with fetiches, cave idols carved in the solid rock, carvings in stone, shell, bone, and wood, and various objects of a utilitarian nature have furnished the much-needed material for comparative studies of Carib and Arawak productions as shown by the various islands.

The main object of these extended investigations is the scientific assembling of facts relative to the manner of inhumations, the stratification of refuse heaps, which may be indicative of widely separated periods of occupancy, and the artifacts from each cultural area. The extension of the South American work to the coastal regions of Venezuela and the Guianas will probably complete the areas from which material is needed for a comprehensive comparison of forms. This should show the mainland influences on the island cultures and possibly indicate the early migrations and the home centers from which came the natives who took up their abode in the various islands of the Greater and the Lesser Antilles.

For several years Mr. Harrington was engaged in ethnological field researches for the Museum. His work among the southern tribes, including the Seminole, Choctaw, Creeks, Cherokee, Chitimacha, Huma, Alibamy, and Catawba, and among the western tribes, including the Delaware, Osage, Shawnee, and other tribes in Oklahoma, the Fox, Sac and Fox, Kiowa, Kiowa Apache and Chirichua Apache and the Kickapoo in northern Mexico, has given the Museum a valuable series of ethnological specimens, including one of the most complete series of scalp, war, tattoo, and other bundles that have ever been brought together. The scalp bundle of the Osage is represented by several examples. It consists of an outer cover made of woven buffalo hair. This is generally tied with a thong of buckskin to which is

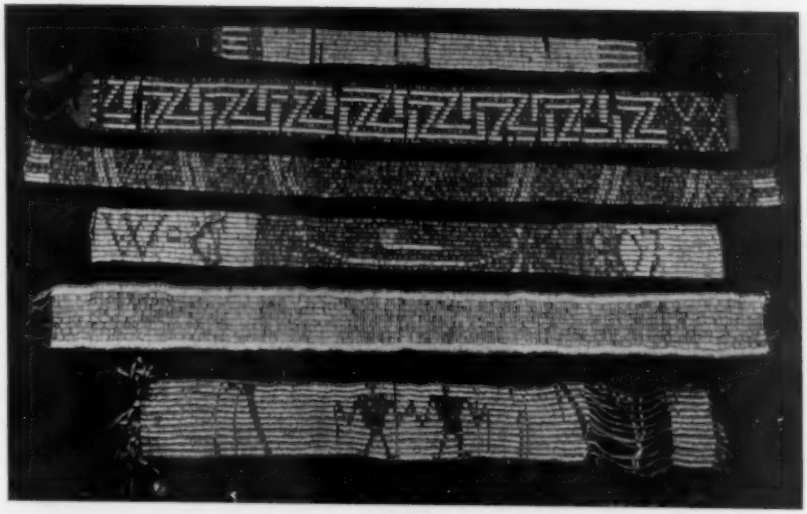

FIG. 9.

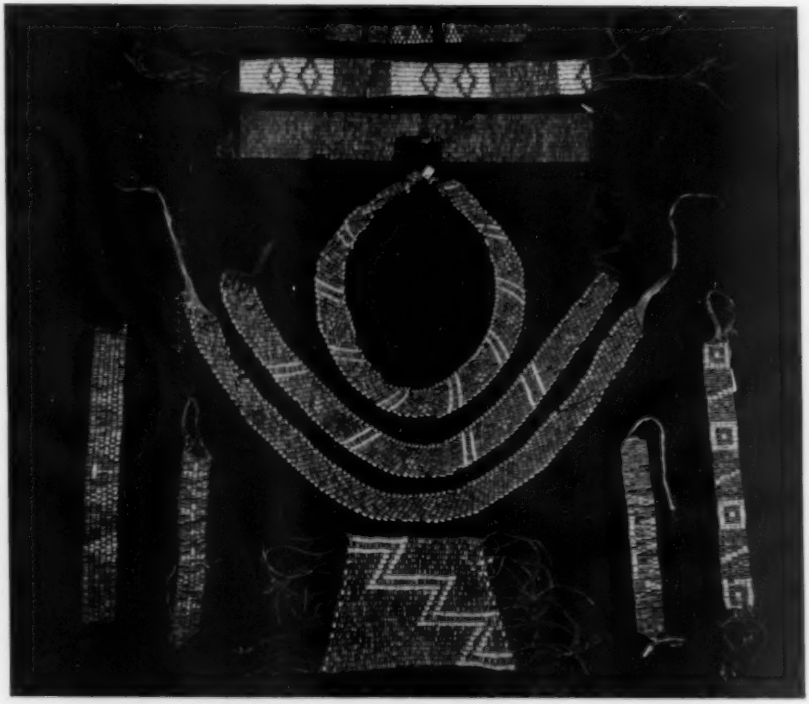

FIG. 10.

FIG. 9—Wampum belts made and used by the Iroquois and other Indians of the eastern part of the United States. The lower one is said to have been used in one of the treaties between the Delawares and William Penn.

FIG. 10—Wampum belts and necklaces and a wampum wristlet. The necklace shown in circular form is composed of glass beads made in imitation of the shell wampum; these beads date from the latter part of the eighteenth century.

attached an eagle leg and claw. Within the buffalo hair bag is a second bag, but this one is made of rushes: it has several buckskin receptacles containing tobacco and other material, but the object of special interest is the bag or pouch containing the war bird. This scalp-holder is the body of a hawk that has been stuffed. Its body is painted and it has a cord by means of which it may be carried. Attached to the band surrounding the hawk is a series of scalp fragments. These are all from human heads and each represents the death of some member of the Osage clan to whom the bundle belonged. When a clan member died it behooved the warrior members to kill an enemy in order that a piece of his scalp might be obtained and assurance given to the spirit of the deceased that he would have company on his journey to the spirit world. Aside from the ceremonial value and historic interest of these bundles they present one of the most interesting evidences of the utilization of the hair of the buffalo in the manufacture of bags; they are perhaps the best examples of this class of work extant.

The ceremonial bundles are repositories for much of the old material that illustrates the esthetic attainments of the early days. Ceremonial objects that, under normal conditions, would have been worn out or destroyed are therein preserved in their original condition. Delicate network made of buffalo-hair cord, snake and other skins embellished with porcupine-quill designs and wonderful quilled belts embodying in their designs the figures of men and animals are a few of the objects that would have been lost to the scientific world had they not been carefully preserved in the skin-wrapped bundles. Mr. W. C. Orchard, head technician of the Museum, who studied porcupine-quill work among the Sioux Indians, utilized many of the techniques found on specimens in the ceremonial bundles in his recent monograph on the technique of porcupine-quill work, which was published by the Museum. These bundles, as well as the moisture-proof caves, have proved to be storehouses of untold riches without which the field of supposition and analogical resort would have been immeasurably greater.

In the summer of 1914, Mr. George G. Heye and the writer explored the ancient council village of the Minisinks near the town of Montague in Sussex County, New Jersey. The cemetery contained over sixty burials, and, although Iroquoian influence was in evidence, much Algonquian material was found. With the bodies were pottery vessels and pipes, bird and animal forms in shell, also objects that showed contact with the early settlers. In the fall of the same year, after the completion of the Minisink work, field operations were transferred to the western part of New York state, where two cemeteries and a large kitchen-midden were explored.

In the spring of 1915, Mr. Heye opened a mound near the town of Canton in Jefferson County, North Carolina; and during the summer and fall of the same year the great Nacoochee mound in White County, Georgia, was explored. This rather extended work was in charge of Mr. Heye, Mr.

F. W. Hodge, of the Bureau of American Ethnology, and the writer. Most interesting and valuable specimens were obtained in this earthwork, including a large series of pipes, an unusual pottery jar in the shape of a dog, and an axe of native copper which is still held firmly in place in the original wooden handle. This specimen was found at the base of the mound, eighteen feet below the surface, and is, so far as known, the only one that has been found in this country. During the present year M. R. Harrington, assisted by Alanson Skinner, Edwin Coffin, and Charles Turbyfill, of the Museum staff, has been engaged in the work of excavating a number of prehistoric mounds and burial places in the vicinity of Ozan and Washington, in Hempstead County, Arkansas, and many unusual ceramic forms were found.

Collections

Among the noted collections that have helped to form the Heye collection is the one brought together by Dr. Joseph Jones of New Orleans. The purchase of this material placed in the Museum most of the type specimens that were figured and described by Doctor Jones under the title "Explorations of the Aboriginal Remains of Tennessee."[2] Made in the early days when good material was procurable and when the smaller mounds of the South had not been rifled, it contained specimens that have never been duplicated. It is particularly rich in material from the Southern states, but, as a consequence of Doctor Jones's omnivorous collecting activities, Mexico, Honduras, Costa Rica, and other regions are represented by stone sculptures and other specimens of note.

Other large collections that have helped greatly in the work include that brought together by the Rev. Mr. Crosby, which was rich in fighting head-dresses of the Tsimshian and Haida; that of Joseph Keppler, containing Iroquoian material, especially masks, wampum belts and strings, also clothing and objects of personal adornment; the Mrs. Thea Heye collection, consisting of selected specimens of old ethnological material from the North American Indians, also a large collection of pipes from the Middle West and various rare forms and general archeological material from the greater part of the United States and Mexico, especially from New Mexico and Utah; the H. K. Deisher material, consisting of specimens obtained from the mounds at Stockton, California, also a large amount of general archeological material; the major part of the Col. Bennett H. Young collection of Kentucky artifacts, including the large series of moccasins and other objects of a perishable nature from Salts, Mammoth, and other Kentucky caves, his entire collection of Kentucky pottery, and other specimens, including most of his pipes and a large wooden figure of a man that was found in a Kentucky cave.

Other acquisitions were the Albert C. Addis collection, which was rich in ceremonial archeological specimens from the United States and contained

[2] *Smithsonian Contributions to Knowledge* 259 (Vol. 22, Art. 2), 1876.

the greater part of the Francis Cleveland collection of pipes, which for many years was exhibited in the museum of the Ohio State University at Columbus, Ohio; and the various collections of Northwest Coast materials brought together by Lieut. G. T. Emmons, including a large series of pipes and other specimens from the Haida, Tlingit, Tsimshian, Niska, and other tribes, also a representative collection from the Tahltan tribe of Alaska. An extremely valuable addition was the material consisting of over a hundred prehistoric mortuary and other pottery vessels from southern California, representing many years of work on the part of E. H. Davis, from whom they were obtained. Recent additions include the Minor C. Keith Costa Rican pottery collection, which embraces over ten thousand specimens from the east coast of Costa Rica; the noted Lady Blake collection of West Indian archeology; the collection of ivory implements and ornaments of the Eskimo and tribes of the Northwest Coast from J. E. Standley; the L. F. Branson collection of pottery and shell ornaments from Yell County, Arkansas; and the A. H. Blackiston collection of Mexican and Central American material that for a number of years was exhibited in the National Museum in Washington, D.C. It contains a wooden mask covered with a mosaic of turquoise, from Honduras, also a large series of pottery vessels from the ruins of Casas Grandes in the state of Chihuahua, Mexico.

Smaller collections in great number and in many instances the purchase of individual specimens have, with the results of expeditions, brought the Heye collection to its present exceptional scientific and numerical strength.

Aims of the Museum

The success of the Heye Museum—the title of the institution prior to the present foundation—is due to the early decision to exclude all foreign specimens and to assist other organizations. The vital interest in the work shown by Mr. Heye, his unflagging energy, his determination to uphold and develop his ideals, and his goodfellowship and *camaraderie* in the everyday work of the Museum have forged his links of hope into a strong chain of reality. The founding of the Museum of the American Indian marks the end of personal effort and opens up a broad field wherein all who are interested in the American Indian can work. Up to the time of the consideration of the present institution, all of the funds for the furtherance of the work, including expeditions, publications, the purchase of collections, and museum maintenance, were furnished by Mr. Heye and his mother, Marie A. Heye, who, up to the time of her decease, was a constant source of inspiration and whose kindly interest was reflected in the great financial aid that she gave to the project.

The results obtained, as a natural sequence, brought the Heye Museum to a position where it needed the help that only organized effort could give. The bringing together of certain individuals who are interested in museum work and who were most favorably impressed with the idea of having a

museum unique in the annals of the country, one that would be devoted exclusively to the American Indian, marked the beginning of the new institution. Mr. Heye agreed to turn over his collections, amounting to over 400,000 specimens, to a board of trustees, and Mr. Archer M. Huntington agreed to deed to the trustees the plot of land on the southeast corner of 155th Street and Broadway, New York City. The architect's elevation drawing shows the museum as it will appear when completed. It will be 65 feet wide and 125 feet in length and will contain four stories and basement. The cost of the building will be about $250,000, the greater part of which has been furnished by the trustees and their friends. The foundation is practically completed, and the building should be finished some time during the coming spring.

The new museum will continue the work of collecting and preserving for future study the esthetic, utilitarian, and ceremonial objects of the tribes of North, South, and Central America, and the West Indies. Special efforts will be made in the direction of locating perishable objects and endeavoring to obtain them for the Museum. A new department, that of Physical Anthropology, has been organized; it will be carried on under the direction of Dr. James B. Clemens, who will be assisted by Dr. Bruno Oetteking, and in the future all skeletal material from expeditions and from other sources will be preserved in the Museum.

The scientific collections will be displayed in cases in such a way that each group will tell a story that will appeal to the general public as well as to the scientist. The main exhibition halls will be devoted to this class of presentation, and in the basement there will be a systematically developed and carefully arranged study collection, where large series of most of the typical forms of each culture area may be seen and examined at leisure.

The publication work started by the Heye Museum has been continued and several monographs have been published under the auspices of the new institution.[3] This work will be extended and will present to the public the

[3] The following is a complete list to date of the publications of the Museum:

The George G. Heye Expedition: Contributions to South American Archeology.

Vol. 1. The Antiquities of Manabi, Ecuador: A Preliminary Report. By Marshall H. Saville, 1907.

Vol. 2. The Antiquities of Manabi, Ecuador: Final Report. By Marshall H. Saville, 1910.

Contributions from the Heye Museum.

Vol. 1, No. 1: Lucayan Artifacts from the Bahamas. By Theodoor de Booy. Reprinted from *Amer. Anthropol.*, Vol. 15, 1913, No. 1.

No. 2: Precolumbian Decoration of the Teeth in Ecuador, with some account of the occurrence of the custom in other parts of North and South America. By Marshall H. Saville. Reprinted from *Amer. Anthropol.*, Vol. 15, 1913, No. 3.

No. 3: Certain Kitchen-Middens in Jamaica. By Theodoor de Booy. Reprinted from *Amer. Anthropol.*, Vol. 15, 1913, No. 3.

No. 4: Porto Rican Elbow-Stones in the Heye Museum, with discussion of similar objects elsewhere. By J. Walter Fewkes. Reprinted from *Amer. Anthropol.*, Vol. 15, 1913, No. 3.

No. 5: Note on the Archeology of Chiriqui. By George Grant MacCurdy. Reprinted from *Amer. Anthropol.*, Vol. 15, 1913, No. 4.

No. 6: Petroglyphs of Saint Vincent, British West Indies. By Thomas Huckerby. Reprinted from *Amer. Anthropol.*, Vol. 16, 1914, No. 2.

No. 7: Prehistoric Objects from a Shell-Heap at Erin Bay, Trinidad. By J. Walter Fewkes. Reprinted from *Amer. Anthropol.*, Vol. 16, 1914, No. 2.

No. 8: Relations of Aboriginal Culture and Environment in the Lesser Antilles. By J. Walter Fewkes. Reprinted from *Bull. Amer. Geogr. Soc.*, Vol. 46, 1914, No. 9.

No. 9: Pottery from Certain Caves in Eastern Santo Domingo, West Indies. By Theodoor de Booy. Reprinted from *Amer. Anthropol.*, Vol. 17, 1915, No. 1.

results of field explorations, general archeological and ethnological studies, and the results of technological researches. The expansion of this educational work in the form of lectures and the availability of specialists to whom the student may go for facts not brought forth by the exhibits, in connection with the large general and specialized libraries, will tend to make the Museum a center for those who are interested in America and the American Indian.

The Board of Trustees of the new Museum includes George G. Heye, Chairman; Harmon W. Hendricks, Vice-Chairman; Archer M. Huntington, James B. Ford, Minor C. Keith, and F. Kingsbury Curtis. Mr. Heye will be the Director of the Museum, Mr. Curtis the Treasurer, and Mr. F. K. Seward the Secretary.

Since the foundation of the new Museum, members of the Board and others who are interested in the institution have donated several valuable collections. Thus, from a private undertaking, superintended and financed by an individual, it has become a great public benefaction—a benefaction that needs the assistance of all who are interested in the preservation of material that will help to a better understanding of the primitive tribes of the two Americas.

Footnote 3, continued—

Contributions from the Museum of the American Indian, Heye Foundation.

Vol. 2, No. 1: Exploration of a Munsee Cemetery near Montague, New Jersey. By George G. Heye and George H. Pepper. 1915.

No. 2: Engraved Celts from the Antilles. By J. Walter Fewkes. 1915.

No. 3: Certain West Indian Superstitions Pertaining to Celts. By Theodoor de Booy. Reprinted from *Journ. Amer. Folk-Lore*, No. 107, Vol. 28, 1915.

No. 4: The Nanticoke Community of Delaware. By Frank G. Speck. 1915.

No. 5: Notes on the Archeology of Margarita Island, Venezuela. By Theodoor de Booy. 1916.

No. 6: Monolithic Axes and Their Distribution in Ancient America. By Marshall H. Saville. 1916.

Vol. 3: Physical Anthropology of the Lenape or Delawares, and of the Eastern Indians in General. By Aleš Hrdlička. (*Bur. of Amer. Ethnol. Bull. 62*, 1916, with added title-page and cover.)

Vol. 4, No. 1: The Technique of Porcupine-Quill Decoration among the North American Indians. By William C. Orchard. 1916.

GEOGRAPHIC INFLUENCES IN BRITISH ELECTIONS*

By EDWARD KREHBIEL
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[With separate map, Pl. V, and key facing p. 432.]

That the factors which determine human desire and action are many and complex is a commonplace. Often enough the only motive force behind man's action seems to be public opinion. This public opinion is at best vague; and thus far no better means has been discovered for ascertaining what it is than elections. Among the many elements which determine political preference there are always the natural influences, and the problem of these pages is whether natural influences leave any tangible or measurable mark on elections in Great Britain. It must be recognized at the outset that one cannot hope for finality in such an enterprise, for, assuming that a group of voters does exhibit clear preferences, it is still a question whether these tendencies result from given natural conditions of environment or from artificial influences. The best one can do is to state the influences, natural and others, as far as they are ascertainable.

It is important to distinguish between natural and economic influences. Economic influences often result from geographic or natural environment; but quite as often they are the result of conditions created by man. Obviously the former, and not the latter, are among the natural forces here meant.

Nothing worth while can be expected from the study of a single election, as the chance of error is prohibitive. But this chance decreases with a multiplication of elections, as each checks up the other and serves to give control of recurrents and variables. The test, then, should rest on many elections, a demand that is not easily met, as election methods and districts have changed so frequently as to offer no long period for study. In the case of Great Britain the present system runs back to 1885, since which there have been the eight general elections upon which this study rests.[1]

*I wish to acknowledge my indebtedness to the following members of my Seminar, History 32, 1913-1914, for valuable aid in the preliminary studies to this map:

S. J. Campbell, George Ingelow, E. J. Oberle, Nellie Allen, Helen Bordwell, LeRoyce Downing, Ileen Bullis (now Mrs. S. J. Campbell), Ila Combe, Nan Drury, Eileen Everett, Katrine Fairclough, Bessie T. Ferguson, Margaret Girdner, Marjorie Haight, Effie Hawkins, Petra Johnston, Helene Montague, Evelyn Saylor, Callie Smith, Edith Smith, Katherine Voris.

[1] The results of these elections are here given in compact form:

	1885	*1886*	*1892*	*1895*	*1900*	*1906*	*Jan. 1910*	*Dec. 1910*
Conservative, or Unionist....	251	316	268	340	334	130	273	272
Liberal-Unionist.....	..	77	46	71	68	27	..	..
Liberals (Gladstone Lib.)...	333	192	275	177	186	376	275	272
Irish Nationalists.....	86	85	81	81	82	83	82	84
Labor.....	..	..	..	..	..	54	40	42

Chapters 34-36 of Lowell's "The Government of England" are very useful in this connection.

The accompanying map (Pl. V) is based on the large-scale detailed maps submitted to Parliament by the Dilke Commission, to which had been assigned the redistricting of the country for electoral purposes.[2] The colors in the map represent the political tendencies of the several constituencies in the eight general elections under consideration.[3] Being a composite or summary, the map furnishes a basis for comparison with maps showing occupations, land values, physical and geological features, density of population, and the like, with a view to discovering any significant correspondence.[4]

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[2] *British Parliamentary Papers*, 1884-85, Vol. 19 (Counties), Vol. 63 (Boroughs).

Of necessity many minor details do not appear in this reduction; but it contains all essentials and is as true to the original as its purpose requires. The only considerable variation is the introduction of circles into the map in order to provide color space for boroughs. As far as possible the centers of the circles coincide with the actual location of the boroughs they indicate. The symbols accompanying the map will explain all other features.

[3] No account is taken of the character of the victory in the several elections, that is, whether the victorious candidate won by a large or a small majority. Hence the conclusions drawn from these elections are open to the just criticism that they would be more reliable if they rested on the actual vote polled by each party. However, the same criticism may be leveled at Parliament. Inasmuch as Parliament is accepted as an adequate representation of popular will, the map, which adopts the same principle, has the same justification.

Space forbids more than the briefest note about English political parties. There are five prominent parties that have seated members since 1885:

1. The Conservatives, or Tories, who are the party of aristocratic and vested interests. They have opposed Home Rule for Ireland and hence have come to be called Unionists.
2. The Liberal-Unionists, who, though having Liberal tendencies, are opposed to Home Rule. They appeared in the election of 1886 after Gladstone had come out for Home Rule.
3. The Liberals, who seek a greater measure of popular rights and control at the expense of the aristocratic group and who have favored Home Rule. They were for a while called Gladstone Liberals.
4. The Labor Party, which, though more radical, has often co-operated with the Liberals. Its influence is too recent to show in a map of this character.
5. Nationalists, the Irish party demanding Home Rule.

[4] The data for this work are drawn from the British Parliamentary Papers listed below, which give the names of candidates and the election results; they do not give the party affiliations of the candidates. The material for the latter is taken from Hazell's Annuals as shown below, the Annual containing the party affiliations as compiled by the *London Times*. To avoid confusion it should be noted that in a few cases the list given in Hazell contains the results of bye-elections following hard upon general elections; in such instances the results of the general elections, which are the only ones considered in this study, were checked up by means of the Parliamentary Papers.

General Election of 1885
British Parliamentary Papers, 1886, Vol. 52, p. 199: Return of Charges Made to Candidates at the Late General Election, 1885.
Hazell's Annual, 1886, pp. 491-510.

General Election of 1886
British Parliamentary Papers, 1886, Vol. 52, p. 45: Return of Charges . . . at the Late General Election, 1886.
Hazell's Annual, 1887, pp. 254-327.

General Election of 1892
British Parliamentary Papers, 1893-94, Vol. 70, p. 423: Return . . . . . Election, 1892.
Hazell's Annual, 1893, pp. 175-186 (contains bye-elections).

General Election of 1895
British Parliamentary Papers, 1896, Vol. 67, p. 145: Return . . . . . Election, 1895.
Hazell's Annual, 1896, pp. 167-176 (contains bye-elections).

General Election of 1900
British Parliamentary Papers, 1901, Vol. 59, p. 352: Return . . . . . Election, 1900.
Hazell's Annual, 1901, pp. 170-180.

General Election of 1906
British Parliamentary Papers, 1906, Vol. 96, p. 302: Return . . . . . Election, 1906.
Hazell's Annual, 1907, pp. 416-426.

General Election of January, 1910
British Parliamentary Papers, 1910, Vol. 73, p. 299: Return . . . . . Election, January, 1910.
Hazell's Annual, 1911, pp. 106-117.

General Election of December, 1910
British Parliamentary Papers, 1911, Vol. 62, p. 272: Return . . . . . Election, December, 1910.
Hazell's Annual, 1911, pp. 369-382.

To do this effectively the whole country was divided into sections. Thus Ireland, Scotland, and Wales for natural and historical reasons are considered separately. England is partitioned according as there are extensive blocks of the same color indicating the predominance of a given party in the region. These sections are shown on Figure 1 as follows: (I) Southwestern England, (II) Southern England, (III) Western England, (IV) Central and Eastern England, (V) Strip across England containing the West Riding of York,[5] (VI) Strip parallel to the above containing the North and East Ridings of York,[5] (VII) Northern England.

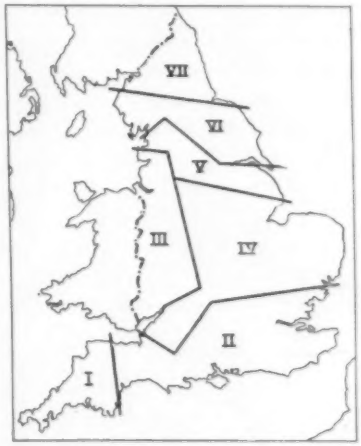

FIG. 1—Outline map showing the sections into which England has been divided for the purposes of this paper according to the predominance in each of a given political party. For key, see the text.

COUNTY CONSTITUENCIES

An almost obvious principle greets us at the very outset, that the Liberal portions of England (colored yellow on Pl. V) are the industrial regions. This is fully confirmed by the occupation statistics in the British census reports.[6] These show that in 1911, in England and Wales, the average proportion of males engaged in certain occupations selected arbitrarily as useful for comparison was as follows:

1. Domestic indoor service (in homes, clubs, hotels, boarding-houses, hospitals, lodges, baths, laundries, etc.)	118 per 10,000
2. Domestic outdoor service (coachmen, grooms, chauffeurs, footmen, domestic gardeners, and gamekeepers)	166 " "
3. Commercial occupations (merchants, clerks, dealers in money, insurance men)	486 " "
4. Agriculture	835 " "
5. Mines (workers in and about mines)	739 " "
6. Metal trades (machine making, iron, steel, etc., electrical apparatus, shipbuilding, vehicles)	1,050 " "
7. Textile trades (manufacture, bleaching, dyeing, printing, etc., of textiles)	344 " "

Incorporating these averages into a table showing the occupations of the Liberal parts of England (Sections I, V, and VII) it will be found that invariably the industrial occupations run above the normal.

[5] North Riding embraces the constituencies of Richmond, Cleveland, Whitby, and Thirsk and Malton; East Riding embraces Buckrose, Holderness, and Howdenshire; and West Riding the remaining constituencies composing Yorkshire, except the city of York (see the list inserted before Pl. V).

[6] *British Parliamentary Papers*, 1913, Vol. 78 (Cd. 7018), p. 496, Table 22A.

TABLE I—OCCUPATIONS IN THE LIBERAL SECTIONS OF ENGLAND

OCCUPATION	AVERAGE PER 10,000	CORNWALL	DEVONSHIRE	W. RIDING YORK
Indoor domestics	118	78	128	61
Outdoor domestics	166	161	862	111
Commercial	486	197	207	285
Agriculture	835	2,030	2,392	666
Mines	739	1,146	144	2,182
Metal trades	1,050	481	320	1,061
Textile trades	344	23	58	1,261
Enclosures (according to Slater)	....	0	0	11.6%

OCCUPATION	AVERAGE PER 10,000	NORTHUMBERLAND	CUMBERLAND	DURHAM
Indoor domestics	118	56	54	36
Outdoor domestics	166	175	140	56
Commercial	486	276	253	214
Agriculture	835	935	1,543	327
Mines	739	3,392	1,595	3,901
Metal trades	1,050	949	795	1,403
Textile trades	344	13	125	9
Enclosures (according to Slater)	....	1.7%	1.1%	.7%

Considering first the West Riding of York (Section V), the very stronghold of English Liberalism, it appears that mining, metal, and textile trades are much above the normal, whereas agriculture is lower. Without exception the county constituencies show a preference for Liberal or Labor candidates. Northern Lincoln, in which great ore beds are now being developed, and Lancaster constituency of Lancashire, in which there are great manufactories, especially of linoleum, are also Liberal.

Northumberland and Durham (Section VII) with their vast coal and iron trades are pronouncedly Liberal; Cumberland, somewhat outside of the great industrial centers, still has an industrial majority and shows preference for Liberals; though Egremont, because it is wholly outside the industrial region, is also outside of the Liberal sphere.

Both Cornwall and Devonshire (Section I) show a preponderance of agriculture over industry and yet are Liberal, thus apparently contradicting the thesis that Liberal districts imply the presence of a laboring class. One has, however, but to consult a map showing the commercial and industrial districts of England to see that the rule is fully confirmed by the facts.[7] In Cornwall and Devonshire, the Liberal majorities lie precisely in the copper and tin mine and the quarry districts. That the other constituencies are mainly Liberal, though according to the census agriculture is their chief occupation, is probably attributable to the inhospitable character of the peninsula, jutting so boldly into the sea and containing the hill regions of Exmoor and Dartmoor. For this is an appropriate place to call attention to the fact that poor agricultural regions show a preference for Liberal candidates. On the contrary, Honiton and Tiverton, the good farming regions of Devonshire, in which the bulk of the agricultural population lives, are Conservative.

[7] Bartholomew's Survey Atlas of England and Wales, Plate 11.

FIG. 2—Map of the coalfields of Great Britain. Scale, 1:4,500,000. Based, for England and Wales, on Map 29 in atlas of report to the Twelfth International Geological Congress, 1913, on "The Coal Resources of the World"; for Scotland, on map in Edward Hull's "The Coal-Fields of Great Britain," 5th edit., 1905. Nomenclature used is derived from both these sources.

Key to coalfields: 1, Clackmannan; 2, Fifeshire; 3, Clyde Basin; 4, Lothians; 5, Ayrshire; 6, Lesmaha Co.; 7, Straiton; 8, Northumberland and Durham; 8a, Cumberland; 9, Ingleton; 10, Lancashire; 11, Yorkshire; 12, Derbyshire; 13, Flintshire; 14, Denbighshire; 14a, Anglesey; 15, North Staffordshire; 15a, Shropshire; 16, South Staffordshire; 17, Warwickshire; 17a, Leicestershire; 18, South Wales; 18a, Pembrokeshire; 19, Forest of Dean; 20, Bristol.

Summarizing: When the laboring class is most numerous in a county constituency the chances are that it will incline to the Liberal or Labor party. The same is true of those constituencies in which rural or agricultural interests predominate, if the farm lands are inferior in quality or if the farmers are themselves small landholders.

The principles just stated for the greater part embody an environmental or natural influence on man in his political action. Geological and other natural factors, such as ore and coal deposits (see map, Fig. 2), waterways, and soil conditions, have governed the distribution of the population and have contributed to creating some of the issues which appear in politics. In this sense we have geographic factors by creating economic and social issues exercising a real influence in politics.

In England, however, the natural are greatly complicated by artificial factors, as will appear from a study of conditions in Conservative England (Sections II, IV, VI).[8] In all of these there is similarity of occupations and conditions: all are agricultural and grazing regions, all show a considerable though varying servant class, and in all great private estates are extensive.

The statistics upon occupations drawn from the census reports reveal that there are four types of counties in the Conservative sections of our map (colored blue): those in which agriculture distinctly predominates (Kent, Dorset, North Riding of York, etc.); those in which commercial occupations run high (Middlesex and Surrey); those in which agriculture and industry run relatively even (Wiltshire, Worcester, Chester); and one in which industry predominates (Lancaster).

In the counties of the Kent group, in which agriculture is the chief occupation, it also appears from Table II that domestic indoor and outdoor service is relatively abundant, implying a wealthy class which maintains servants. This is further borne out by the circumstance that, though the land is highly suited to mixed agriculture, a smaller proportion of it is under cultivation than in eastern England north of the Thames.[9] Pasture land, conversely, is more abundant than in the region north of the Thames, running in some parts up to forty and fifty per cent of the area, and grazing is an important industry.

This fertile region of England is one of the strongholds of the landed aristocracy. The abundance of pasture lands signifies the presence of extensive enclosures, or great private estates of wealthy landlords. In this part of England the titles to estates run back into medieval days[10] and there

[8] Conspicuous among the artificial influences in British elections is the Home Rule question, which has been paramount since the election of 1886. The extent of this influence is best manifested by the strength of the Liberal-Union Party, which was created by opposition to Home Rule.

[9] Bartholomew's Survey Atlas of England and Wales, maps on Plate 3.

[10] The percentage of enclosures given in Table II are from Gilbert Slater: The English Peasantry and the Enclosure of Common Fields, London, 1907, pp. 140-147. Slater's work, however, deals merely with enclosures occurring during the seventeenth and eighteenth centuries; his figures do not account for enclosures in earlier periods, and hence are not to be taken as totals for the counties of southern England, in which the titles to estates date back into the feudal era.

TABLE II—OCCUPATIONS IN THE CONSERVATIVE SECTIONS OF ENGLAND

OCCUPATION	AVERAGE PER 10,000	ESSEX	KENT	SUSSEX	HERTFORD	BUCKINGHAM	BERKSHIRE
Indoor domestics	118	118	153	455	177	149	240
Outdoor domestics	166	171	285	1,652	527	499	828
Commercial	486	868	351	393	467	230	217
Agriculture	835	1,121	1,245	4,436	1,525	2,118	1,974
Mines	739	16	57	67	20	12	12
Metal trades	1,050	631	714	553	380	702	346
Textile trades	344	23	15	33	7	7	9
Enclosures (according to Slater)	....	2.2%	0	1.9%	13.1%	34.2%	26.0%

OCCUPATION	AVERAGE PER 10,000	HAMPSHIRE	DORSET	SOMERSET	SURREY	MIDDLESEX	WILTSHIRE
Indoor domestics	118	151	120	92	251	151	106
Outdoor domestics	166	506	401	339	599	128	377
Commercial	486	174	204	284	720	1,004	190
Agriculture	835	1,543	2,011	2,151	819	354	2,253
Mines	739	13	197	498	27	10	83
Metal trades	1,050	590	351	396	377	638	1,211
Textile trades	344	4	75	151	13	4	83
Enclosures (according to Slater)	....	6.4%	8.7%	3.5%	6.4%	19.7%	24.1%

OCCUPATION	AVERAGE PER 10,000	MONMOUTH	WORCESTER	SHROPSHIRE	CHESTER	LANCASTER
Indoor domestics	118	37	86	102	89	72
Outdoor domestics	166	101	248	377	271	90
Commercial	486	185	542	234	649	441
Agriculture	835	606	1,335	2,422	1,085	587
Mines	739	4,225	121	645	134	1,158
Metal trades	1,050	974	1,853	841	1,075	891
Textile trades	344	3	231	35	678	1,983
Enclosures (according to Slater)	...	.4%	16.5%	.3%	.5%	0

OCCUPATION	AVERAGE PER 10,000	STAFFORD	N. RIDING YORK	E. R'DING YORK	WESTMORLAND
Indoor domestics	118	52	88	88	82
Outdoor domestics	166	151	304	304	410
Commercial	486	352	260	260	232
Agriculture	835	773	3,658	3,658	2,538
Mines	739	1,563	34	34	213
Metal trades	1,050	2,196	381	381	366
Textile trades	344	96	65	15	144
Enclosures (according to Slater)	....	2.8%	6.3%	40.1%	.6%

still exists a feudal atmosphere, observable chiefly in the deference of the common people toward the landlords. It is no wonder they are subservient, for they are tenants with leases running normally for one year and with inadequate legal means of recovering costs of improvements if renewal of the lease should suddenly be refused. Quite intelligible is it also that they vote for Tory candidates and that so frequently the elections in these parts are not even contested.

In Surrey, agriculture stands out less prominently than in other counties and is approached by commercial occupations; and in Middlesex commercial occupations far outrank all others. The explanation for this is, of course, that the London boroughs lie chiefly in these two counties and that suburban conditions are characteristic. The portions outside of the metropolitan sphere are, like the rest of southeastern England, controlled by the landed aristocracy, and are Conservative.

Counties of the third type, in which agriculture and industries both figure prominently as occupations, do not militate against the tendencies already discovered. To illustrate: In Worcestershire, the southern constituencies, in which the agricultural population lives, are pronouncedly Conservative. The industrial population is found in the northern constituencies in the vicinity of Birmingham, and its political reactions are away from Toryism. In Wiltshire the three constituencies showing a preference for the Conservatives are agricultural. The other two go Liberal: one, Westbury, contains the industrial centers east of Bath; the other, containing Marlborough Downs, is in parts a poorer agricultural region. Similarly with Chester. The larger constituencies lie in the rich Cheshire Plain and return Conservative members to Parliament. The smaller and hence more heavily populated districts lean toward the Liberals. Wirral, despite its large industrial population, is Conservative, because it contains the country seats of rich Liverpool merchants and because the Lairds (of Cammel Laird and Company) have used their power over their employees to secure a Tory vote.

The same precisely is true of Lancaster, in which, as has already been noted, the industrial elements greatly predominate. A careful study of the map shows that the country constituencies of Lancaster (the boroughs are considered elsewhere) are of two kinds: those having a small area that is densely inhabited and the large districts, relatively sparsely populated. The latter, which lie in the western part of the shire, are with a single exception preponderantly Conservative; which is to be expected, as they are agricultural districts and contain the estates of wealthy Catholic Tories. Conspicuous among the landlords of this region are Lords Sefton and Derby, the latter of whom controls Bootle constituency. The more densely populated districts, which lie in the coal region, favor the Liberal or the Labor parties. In no instance do the Conservatives prevail. The predominance of the Conservatives in Lancaster is therefore more apparent than real;[11] in fact, Lancaster has but to be broken into its true divisions to behave like any other part of England; the eastern part of the shire is industrial and Liberal or radical, is, in short, a continuation of the West Riding of York; the western part of the shire, with its landed gentry, is Conservative.

Central and Eastern England (Section IV on Fig. 1) seems mottled (on Pl. V), and it appears hopeless to seek an explanation for so miscellaneous a district. However, the principle just applied elsewhere, that industrial communities are predominantly Liberal in politics, holds true here quite as well. The Liberal parts of Monmouth, Gloucester, Oxford,

[11] The circumstance that on the map Lancaster appears almost wholly blue (Conservative) is one of the deceptions which must be guarded against. It arises from the accident that, though both have equal value in representation, the Tory districts are large and the Liberal are small, and the blue is therefore more conspicuous.

Warwick, Buckingham, Northampton, Leicester, Derby, Nottingham, and, as already noted, of Lincoln, all contain large labor populations.

TABLE III—OCCUPATIONS IN PART OF CENTRAL AND EASTERN ENGLAND

OCCUPATION	AVERAGE PER 10,000	MONMOUTH	GLOUCESTER	OXFORD	WARWICK	BUCKINGHAM
Indoor domestics	118	37	113	155	93	149
Outdoor domestics	166	101	416	581	285	499
Commercial	486	185	241	198	420	230
Agriculture	835	606	1,974	2,935	1,143	2,118
Mines	739	4,225	699	49	1,054	12
Metal trades	1,050	974	517	378	1,377	346
Textile trades	344	3	117	113	48	9
Enclosures (according to Slater)	....	.4%	22.5%	45.6%	25.0%	26.0%

OCCUPATION	AVERAGE PER 10,000	NORTHAMPTON	LEICESTER	DERBY	NOTTINGHAM	LINCOLN
Indoor domestics	118	102	97	60	66	39
Outdoor domestics	166	333	295	134	185	103
Commercial	486	204	241	257	305	179
Agriculture	835	1,966	1,492	813	1,230	4,428
Mines	739	323	1,335	2,906	2,530	2
Metal trades	1,050	516	677	840	673	297
Textile trades	344	2	643	580	378	9
Enclosures (according to Slater)	....	51.5%	38.2%	15.9%	32.5%	29.3%

Bedford, Cambridge, and Norfolk seem to run counter to this rule, for in each the agricultural class is preponderant. To be sure, in Bedford there is a considerable industrial class, engaged in the manufacture of straw hats and bonnets, for which Luton is famed.[12] But the real reason

TABLE IV—OCCUPATIONS IN PART OF CENTRAL AND EASTERN ENGLAND

OCCUPATION	AVERAGE PER 10,000	BEDFORD	CAMBRIDGE	NORFOLK
Indoor domestics	118	97	266	93
Outdoor domestics	166	222	301	439
Commercial	486	240	233	145
Agriculture	835	1,957	3,011	3,935
Mines	739	57	14	26
Metal trades	1,050	986	309	370
Textile trades	344	18	7	14
Enclosures (according to Slater)	....	46.0%	36.3%	32.3%

why these agricultural areas are Liberal is that they are filled with small landholders or agrarians. These small landholders are often prosperous, for the soil of the Fenlands is the best there is in England; but they have not forgotten the enclosure acts of the last two centuries, and they voice their protest by voting the Liberal ticket. This region is also a strong center of Nonconformity, which strengthens the Liberal vote. And in Norfolk, where the soil is not so rich, there is again the modest farmer with his radical tendencies.

The enclosure acts just mentioned account for the strength the Tory party has always shown in northern Nottingham, western Lincoln, eastern

[12] In Bedfordshire 603 per 10,000 males are engaged in straw hat making,—more than anywhere else in the country.

Leicester, Rutland, Huntingdon, upper Northampton, and in the inland districts of Norfolk and Suffolk. As already noted, in southeastern England the landlords secured their titles in feudal times. Not so in other parts of England, for in these the present titles to the great estates were secured through the Parliamentary enclosures acts of the eighteenth and nineteenth centuries. The districts affected by the enclosure acts are well shown by a map in Slater's instructive work on "The English Peasantry."[13] A glance at this map will show that most of the enclosures lie in that portion of England (Section IV) which is now under consideration.

The extent of these enclosures is nothing short of astounding, running up toward fifty per cent of the acreage in the region about Rutland.[14] In Northampton 51.5 per cent was taken from the commons and given to privilege. The condition thus produced is obviously highly artificial, and hence the influence it exercises on politics is likewise unnatural. There is, however, a natural feature in this connection that should not be overlooked, that in making these expropriations the beneficiaries everywhere selected the very best that nature had to offer, particularly in the Fens of the East Midlands.[15]

Once this selection was made, economic considerations became paramount; it became a problem of maintaining, if not extending, the estate. With the rise of liberal and anti-aristrocratic parties in the nineteenth century, the legal processes of enclosure came to an end, and with the passage of time there has developed an ever-increasing tension between the vested rights in lands and the other portions of the population, a tension which had arrived near to the breaking point when the great war intervened, and which may yet lead to intestine strife. The rival interests naturally appear in politics, and precisely in these regions of greatest enclosure the political rivalry between landlord and small landholder is keenest. Elections are often very close, and each party resorts to every known form of pressure, the Tories practically dictating the politics of their tenants and tradesmen. Their power may be seen very clearly by comparing the election maps of Norfolk and Suffolk with a map[16] showing the enclosures in those counties, from which it will appear that the Liberals are strongest in the constituencies in which the enclosed area is smallest.

In Wales a combination of circumstances returns a majority of Liberal and Labor candidates. In the first place there are the great mining and industrial areas of South Wales, and the minor lead and tin mines in other parts. By nature also the country is not adapted to agriculture, and here it is true as elsewhere that a hard life tends to produce radical thinking, a circumstance which accounts for the Welsh Agrarian Democrats. This

[13] Slater: work cited in footnote 10, map facing p. 73.

[14] Slater (*ibid.*, pp. 140-147) gives a table showing the percentage of the area of each county thus enclosed. These figures are incorporated in Tables I, II, III, and IV of this paper.

[15] *Ibid.*, map facing p. 196. It seems that with the change in agricultural methods many estates are no longer so valuable relatively as they were when enclosed.

[16] *Ibid.*, map facing p. 197.

tendency is aggravated by the pressure of landlordism, which makes Liberal tendencies more pronounced. Finally, there is the Nonconformist movement which demands the disestablishment of the Church in Wales and looks to the Liberals to bring it about. The educational system of Wales, which is superior to that of England, has also been a factor in determining the general result.

Scotland has steadily been loyal to the Liberal Party. Partly this is due to historical factors, the natural caution against too great a centralization of government in the once hostile England. As in Wales, there is a better system of education, and there is the fear of landlordism. Likewise in the highlands there are the crofters, who exhibit the hardy self-reliance and independence characteristic of mountain peoples. On top of all these factors the industrial populations strengthen Liberalism, for it is the labor constituencies about Glasgow, Edinburgh, and the eastern lowlands generally which most persistently return Liberal members.[17]

In Ireland the situation is reversed, for there the populous industrial regions of Ulster return Conservatives, while the more sparsely inhabited rural portions of the island return Nationalists. This situation is in part the result of circumstances notorious as the Ulster or Home Rule problem, which are man-made in the sense that they are the fruit of the penetration into a rural Catholic country of a privileged landed aristocracy, owing allegiance to the Church of England, and a wealthy class of Scottish Presbyterians, who developed the industry of Ulster. The religious and economic hostility of these groups accounts for politics in Ireland. It is, to be sure, pertinent to ask why the industrial population in those parts should not, as in England, be radical. The reason is that a considerable portion of the industrial class is Protestant—the Catholic or Irish population in Antrim, Armagh, Down, and Londonderry is less than fifty per cent—and votes with the dominant class, and, furthermore, that so far no attempt has been made to organize the industrial vote in opposition to the Tories. In not a few of these constituencies elections are uncontested. When contested they are invariably close, which gives color to the belief of some that if the Liberals organized and financed an opposition in Ulster they could win from six to ten additional seats.

There is, however, a natural condition which caused the concentration of the great industries of Ireland in Ulster, and that is the adaptability of this region, the only one of the kind in the British Isles, to the growing of flax. This accounts for the flax fields of Ulster and the great manufactories of Irish linen in Belfast.

Boroughs

Cities, being in a sense artificial, are more influenced by artificial than by natural causes in politics. To be sure there are geographical reasons

[17] *British Parliamentary Papers*, 1913, Vol. 80 (Cd. 6896), Census of Scotland, 1911, Table XXVII: Occupation of Males by Cities and Counties.

for the locations of cities which account for the great sea ports, the industrial, mining, or agricultural centers. However, these alone do not at all explain the political tendencies of communities.

In boroughs as in counties it is true as a fundamental principle that the laboring classes are radical in tendency and vote with the Liberal or Labor parties. In so far as natural features, such as ore deposits, water-power, or other geographic factors, contributed to creating labor centers, it may be said that natural conditions influenced politics. That laboring classes are ordinarily progressive or radical is known; but whether this tendency is an inevitable consequence of living in masses, or is merely the result of prevalent economic conditions, themselves in part the result of legislation, is not clear.[18] That the latter is a great factor is indisputable, as already illustrated by the political opposition of the small landholders of England to the privileged Tories.

The parliamentary boroughs of Scotland, Ireland, and Wales generally vote as do the contiguous county constituencies—that is, Liberal in Scotland and Wales, Tory in parts of Ulster, and Nationalist in the rest of Ireland—and for the same reasons.

In England industrial boroughs show a disposition to favor Liberal and Labor candidates, a disposition which often fails of effect, because of current election practices, such as the registration of votes, plural voting, and others. As for boroughs with traditional influences, such as cathedral and university cities, and boroughs within the pale of landlordism, they stand with the Tories.

Applying this generalization it will be seen that the smaller industrial boroughs of the West Riding of York, of Northern England, and of Central and Eastern England, such as Derby, Nottingham, Leicester, Northampton, Bedford, Bristol, Ipswich, and Norwich (in Section IV), as also Stafford, Stoke-upon-Trent, and Newcastle-under-Lyme, lean toward the Liberals.

The really surprising fact, however, is that so large a proportion of industrial boroughs are for the Tories. This is notably true of Liverpool, but it is conspicuous in all the large manufacturing centers,—Manchester, Sheffield, Leeds, and Birmingham, not to mention a number of smaller boroughs in Lancashire and Cheshire.

The explanation for this contradictory state of things is to be found in a number of artificial factors chiefly of a political nature, which reverse the natural tendencies. A summary of these factors is all that is pertinent here.

To vote in England one's name must appear on the register. To get on the borough register a lodger must have resided in the same quarters for twelve months and have paid a rental amounting to £10 for the year. With a year of residence and the time that may elapse before the legal process of inscribing the name on the register is complete, it may mean eighteen

[18] The exception in Ulster has just been noted and explained.

months of residence before one is qualified to vote. Obviously this provision eliminates transients, such as many laborers are bound to be. This £10 rental is not high, but it does eliminate all paupers, and with them a radical vote.

Another provision, now almost peculiar to England, is that a person may vote in every constituency in which he is qualified. This is plural voting. In the case of boroughs it means that one has but to maintain a legal residence, which is, in effect, paying £10 for lodgings, to be entitled to vote. Considering that the pollings in England do not, as in other countries, occur on one day, but may run over twelve, the significance of plural voting may be surmised.

The two factors noted operate to eliminate the poor man, the laborer, and to multiply the voting strength of the man of means, the Tory, thus making clear why so many constituencies return Conservatives when one would expect their political opponents to win.

The business and warehouse districts of English boroughs return Conservative members for the simple reason that the electoral system gives the property owners the predominance. If the property owners in the Wall Street district of New York, in which relatively few persons live, were to elect a representative, they would unfailingly choose a stand-patter. For similar reasons the Central constituencies of Glasgow, Sheffield, Leeds, and Birmingham, the Northwest of Manchester, and the City of London are Tory. Why Exchange constituency of Liverpool violated this rule is noticed below.

The Toryism of Liverpool is explained by local political conditions. The Tories have control of the municipal council, and they have used this control to meet the demands of the labor elements by passing surprisingly radical legislation. The effect has been to leave no room for a local opposition party, with the result that when it comes to national elections the Tories meet no real difficulty. Only in Scotland constituency, where the Irish dockers live, are the Tories outdone.

The political complexion of Birmingham and of neighboring boroughs is largely the result of the personal influence of the late Joseph Chamberlain and of his protectionist and Unionist policies. The Schnadhorst or Birmingham Caucus, Chamberlain's political machine, and one of the most powerful in Britain, has with scientific precision returned members pledged to oppose free trade and Home Rule for Ireland. The marvel of this achievement appears when it is noted that in 1885 every constituency of Birmingham stood for John Bright's free trade program. The city passed from Liberals to Liberal-Unionists, and of late has shown a tendency to out-and-out Unionist politics.

To 1906 Manchester was on the whole controlled by the Tories. But with the injection of protection into politics, the prosperity of Manchester, which depends on imported cotton, was threatened, and Tories joined

Liberals to uphold free trade; hence, since 1906 only one Conservative has been seated in a general election. Exchange constituency in Liverpool, which largely depends on cotton trade, reacted sympathetically and returned Liberals in two elections.

As has been noted, cathedral boroughs or those in Tory areas usually seat Conservatives. York is a notable exception. The simple reason is that there is a considerable industrial class in the city engaged principally in the production of foods and drinks, and especially of confectionery.[19]

The London boroughs follow the rules already laid down. Those containing the homes of the poorer classes (the crowded parts of Tower Hamlets,[20] Bethnal Green, Shoreditch, Islington, St. Pancras, Southwark, Newington, and Camberwell) all return Labor or Liberal members. Battersea has been carried by John Burns for the Labor party. The residential districts of London are strongly Conservative.

The university constituencies must be briefly mentioned. There are six of these, some with two seats: Oxford (two seats), Cambridge (two seats), London, Edinburgh and St. Andrews, Glasgow and Aberdeen, and Dublin (two seats). With the single exception of the University of London, which in 1885 returned a Liberal, university members have always belonged to the Conservative wing.

From the foregoing it is evident that geographical or natural factors have contributed very materially in creating the conditions which determine political predilections; and that a multitude of artificial factors have done likewise. It is true in some instances, if not in all, that the political devices of the vested interests have secured precisely the opposite product from that which would have resulted had matters been allowed to take their natural course.

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[19] Of the population of York over ten years old, 9.6 per cent. are engaged in the chocolate and cocoa trades. York is the seat of the great Rowntree chocolate works.

[20] The Conservative area in Tower Hamlets is a Hebrew quarter whose inhabitants are influenced in their politics by incompatibility with their neighbors.

THE CHURCHILL RIVER*

By FREDERICK J. ALCOCK
Geological Survey of Canada

Of the many rivers that flow into Hudson Bay, the second largest in size and one of the most interesting from a historical and geographical point of view is the Churchill. Discovered in 1619, it was used for over one hundred years as a trading route of the Hudson's Bay Company from their fort at its mouth to the interior. In the year 1821, however, it was abandoned so completely that, for a portion of its lower course, no information was available until it was mapped by the writer in 1915.

In many respects it is a river typical of the great northern interior portion of Canada, a river of rapids, falls, narrow chutes, broad lake expansions dotted with islands, and long, placid stretches of smooth water, a stream for travel by canoe only. Its length is approximately one thousand miles, and its basin occupies 115,500 square miles, an area greater than that of Italy and almost as large as that of Great Britain and Ireland. To the south of it is an area of 4,000 square miles at present a complete blank on the map, while to the north of it lies a region covering 73,000 square miles, totally unexplored by white men. The upper portion of its basin is much better known; it is more easily accessible, and as a result more survey work has been done there.

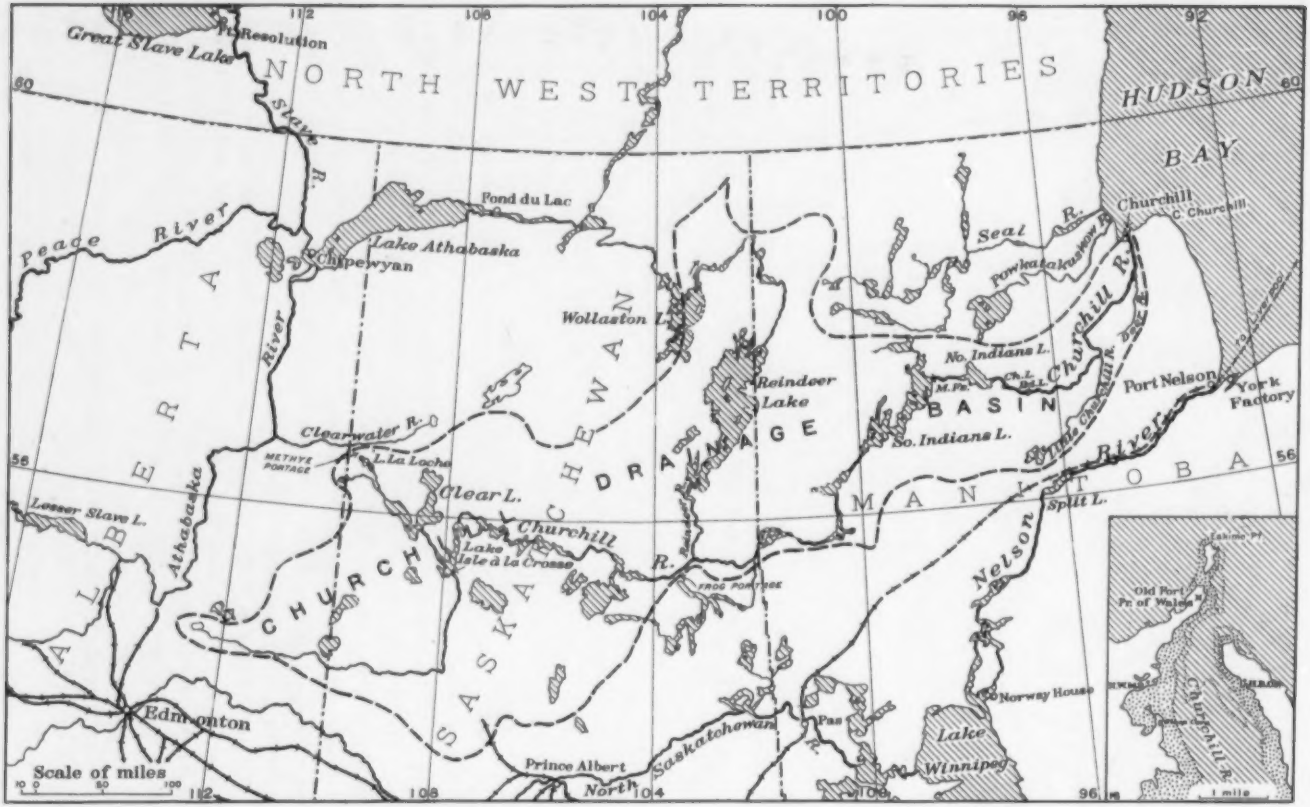
Early History and Exploration

The history of the region begins with the discovery of Hudson Bay. In 1610 Henry Hudson entered the bay and sailed its entire length to the head of James Bay. In the following year occurred his tragic death after being marooned in an open boat by his mutinous sailors. In 1612 Sir Thomas Button sailed along the west coast of Hudson Bay in search of a northwest passage to China and in vain hopes of finding some trace of Hudson. Button wintered at the mouth of the Nelson River and in the following spring sailed north along the coast past Cape Churchill. It remained, however, for a seaman of another nationality to discover the Churchill River and the best harbor on the west coast of Hudson Bay.

In the autumn of 1619, Jens Munck, a Danish sea-captain, sailed across Hudson Bay in search of the much-desired northwest passage, with two vessels, a war ship named the *Unicorn* and a small sloop, the *Lamprey*. Driven by a heavy gale Munck came to an opening between breakers on a rock-bound shore. He had discovered the large natural harbor of Churchill.

Munck spent the winter there. In preparation for it, an ice-break was made around the keels of his vessels, great quantities of wood were collected

* Published by permission of the Director of the Geological Survey, Ottawa, Canada.



Sketch-map showing the drainage basin of the Churchill River. Scale, 1:8,100,000. Based on the base map of Canada, 1:6,336,000, published by the Department of the Interior, Ottawa. *Abbreviations:* Ch. L., Churchill Lake; Bd. L., Billard Lake; M. Fs., Mission Falls. *Note:* The route of the Hudson Bay railroad between Pas and the lower Nelson River in 95° W. is incorrectly shown. It should parallel the line, as here indicated, on its southeastern side at an average distance of about 25 miles and cross the Nelson River at Manitou Rapids, about 20 miles above Split Lake, and at Kettle Rapids (95° W.).

The inset, 1:160,000, based on Chart 401 of the Department of the Naval Service of Canada, shows Churchill harbor and the mouth of the river.

from the forests which at that time extended to the water's edge, and rough fire-places made of rocks were built on the decks of his two vessels. The winter was a terrible one to the sailors unaccustomed to such a severe climate and to the best methods of protecting themselves against it. Through exposure and scurvy, one after another of the crew perished, until in June only Munck himself and two of his men survived. When the ice finally went out in the spring the three men succeeded in getting the smaller of the two ships, the *Lamprey*, afloat and in it sailed to Denmark. Before leaving, however, Munck bored holes in the hull of the *Unicorn* and sank her with all her freight, with the intention of returning later to rescue her. On reaching Denmark, however, the outbreak of war in Europe demanded Munck's services for his sovereign in another field and he made no more journeys to Hudson Bay.

The *Unicorn*, however, did not remain long undisturbed. On descending the river, Indians discovered it with the bodies and clothing of a race which they had never before seen. While they were plundering the vessel, the gunpowder on board was exploded and ship and Indians alike were destroyed. Some eighty years later a brass cannon with the stamp C4—Christian IV—was dug up from the river flats of Churchill harbor, which proved conclusively that here was the location of Munck's winter quarters. The Cree name for the Churchill River dates from Munck's visit. It is still called by them the "Mistayseebee," or Great-River-of-the-Strangers.

With the establishment of the Hudson's Bay Company in 1670, trading posts were soon built on Hudson Bay, the first five forts being at Albany River, Hayes Island, Ruperts River, Port Nelson, and New Severn. In the year 1686 a Captain Abraham sailed north from Port Nelson and established a post at the mouth of the Churchill River, naming it after the newly appointed governor of the company, Lord Churchill, afterwards first Duke of Marlborough. In 1718 a wooden fort was built on the river about five miles from its mouth on the site of the trading-post occupied at present by the company. This fort, to which was given the name Fort Prince of Wales, did not remain long in use, however. In 1694 a French fleet under the command of the noted admiral Iberville had sailed into Hudson Bay and captured Port Nelson. When the territory was restored to the English in 1713 by the Treaty of Utrecht, a strong sentiment arose in favor of strengthening all the company's forts. This finally culminated in the building of a new stone Fort Prince of Wales on Eskimo Point at the mouth of the Churchill River to serve as a protection for the company's best harbor.

The new fort was begun in 1736 and finished in 1771. It was designed by military engineers who had served under Marlborough, and at the time of its completion was the strongest fort in North America, its walls surpassing in strength even those of Quebec. According to the original plans its walls were to have been 42 feet thick, but owing to the objection of the governor they were first built with a thickness of but 25 feet. It was after-

The inset, 1:160,000, based on Chart 401 of the Department of the Naval Service of Canada, shows Churchill harbor and the mouth of the river.

FIG. 2—Churchill River: A chute 13 miles below Churchill Lake. (Figs. 2 to 11 inclusive are from photos of the Geological Survey of Canada.)

FIG. 3—Chipewyan Indians and their tepees at Fond du Lac on Lake Athabaska.

wards found, however, that the walls had a tendency to sink when heavy guns were fired on them, so one section was pulled down and rebuilt according to the original specifications. The armament consisted of forty guns varying from six to twenty-four pounders. It was from this fort that Samuel Hearne started on his famous overland journeys in 1769-1770, in the course of which he discovered the Coppermine River and Great Slave Lake. These expeditions were most important from the fact that they were the first attempt on the part of the Hudson's Bay Company to explore the country inland. Hitherto they had never ventured away from the coast at Churchill, depending on the Indians to come to them to trade. Hearne's work marks the beginning of a new era for the company and for the country.

Hearne's name is also associated with that of Fort Prince of Wales in connection with the most striking event of its history. As a reward for his services in carrying his explorations to the Coppermine River, Hearne was appointed governor of the fort, but his rule was destined to be but brief. One afternoon in August, 1772, a French fleet under the command of Admiral de la Pérouse appeared before the fort; its intentions were unsuspected by Hearne, who was totally unaware that France and England were at war. His surprise, therefore, can be imagined when, early in the following morning, he received a summons to surrender from four hundred French soldiers drawn up in front of the fort. The garrison consisted of but thirty-nine men, a totally insufficient number to withstand a siege, and Hearne promptly capitulated. After endeavoring to demolish the thick walls of the fortress, La Pérouse sailed away, taking Hearne with him as a prisoner. When peace was signed in the following year between England and France Hearne was sent back by the Hudson's Bay Company to take charge again at Churchill. He did not attempt to occupy the fort again, however, but established his residence five miles up from the fort on the site of the original trading-post of the company, where wood and fresh water were more available. The old abandoned fort stands today in practically the same condition in which the French left it. Another interesting reminder of Hearne may also still be seen today at Churchill. On the smoothly glaciated rock surface of what is known as Sloop Cove, so called from the fact that two of the company's vessels, the *Furnace* and the *Discovery*, spent the winter of 1741-1742 there, may be found carved the names of a number of men, some in letters seven feet in length. Among them is the following: "Sl. Hearne, July Ye 1, 1767," undoubtedly carved by himself with chisel and hammer.

Of the early exploration of the Churchill River very little is known. The old map of the portion of the river from its mouth up to Isle à la Crosse is supposed to have been made by Peter Fidler, an early pioneer trader and explorer, who acted as a surveyor for the Hudson's Bay Company. It is thought that Fidler spent the winter of 1808-1809 at Fort Churchill and in the summer of 1809 made his track survey of the river. It is also highly

probable that the years 1809-1811 were spent by him in continuing his surveys on the Powkatakuskow and Seal Rivers to the north in the effort to find some easier route than the Churchill to the upper portion of the river and to the Athabaska region, but evidently no such route was discovered.

It is unfortunate that we do not know more about the life and work of this explorer. In many respects he was a most interesting and remarkable character.[1] He was a man of good physique, a hard worker and an equally hard drinker, a great reader and student, but of an irritable disposition, with little consideration for others. He himself tells of passing, while on one of his long canoe trips, a fellow surveyor, David Thompson, without either stopping or speaking, and from what is known of Thompson's character it is highly probable that the lack of friendliness shown on this chance meeting in the wilderness was due to Fidler. His will is a further illustration of the eccentric character of the man. After bequeathing a number of legacies, he directed the balance of his estate to be placed in the public funds and to be allowed to accumulate until August 16, 1969, the two-hundredth anniversary of his birth; the heir of his youngest son, Peter Fidler, was then to receive the accumulated amount.

After the union of the North-West Company with the Hudson's Bay Company in 1821, which followed a long period of rivalry for the trade of the interior, the lower part of the Churchill River was completely abandoned as a trading route. In its place the Saskatchewan River, which had long been used by the North-West Company, now became the important route to the upper Churchill country and the Athabaska region. Since that time the lower Churchill has been descended but a very few times. The Chipewyan Indians who trade at Fort Churchill travel overland, making most of their journeys with dogs in winter. The river is also avoided by the Cree Indians of Split Lake on the Nelson River, who occasionally make trips to Fort Churchill over a portage route leading to the Little Churchill River. The latter is followed to its junction with the main Churchill; three miles below where they unite the latter is left and a portage route followed to the Deer River, a much smaller stream flowing parallel to the Churchill and entering it about twenty-two miles above its mouth. This route is a difficult one to follow, especially in midsummer, when the water of the Deer is so low that almost continuous portaging is necessary. In spite of this fact, however, the Indians invariably use it rather than descend the "Great River of the Strangers," of which they stand in great dread. In 1915 the writer received many warnings from well-meaning Indians at Split Lake as to what would befall if an attempt should be made to go down the main river, but as will be shown later it proved to be an excellent stream to descend.

The country drained by the Churchill River is typical of the physiographic province to which the name Laurentian Plateau is applied, a region

[1] J. B. Tyrrell: Peter Fidler, Trader and Surveyor, 1769 to 1822, *Proc. and Trans. Royal Soc. of Canada*, 3rd Series, Vol. 7, 1913, Section 2, pp. 117-127.

FIG. 4.

FIG. 5.

FIG. 4—A gorge on the Churchill River.
FIG. 5—Typical rapids on the Churchill River.

FIG. 6.

FIG. 7.

FIG. 6—Barren Ground topography near Fort Churchill.
FIG. 7—Hudson's Bay Company post at Split Lake, Nelson River.

of pre-Cambrian rocks, mainly granites and gneisses, covering an area of over a million square miles in the form of a letter V surrounding Hudson Bay. Its most striking feature is the remarkable regularity over so great an area. There are no high elevations; the general level of the interstream areas is seldom more than 200 feet above the level of the streams; those that do rise even but slightly above this height stand out as prominent hills. The surface is very uneven and hummocky, consisting of hollows and ridges, the former usually occupied by lakes or muskeg and the latter frequently having precipitous sides. Residual soil is almost entirely lacking. The drainage is highly disorganized. Lakes are numerous; streams expand and contract along their course, and rapids and falls are characteristic features. In many places the run-off is undefined by channels and spills over rock cliffs.

Modern Exploration, and Description of the River

The upper portions of the Churchill River have been mapped by T. Fawcett, J. B. Tyrrell, and Wm. McInnes; a full description of these parts is given in the reports of the last two.[2] The portion of the river from its headwaters at Lake La Loche to Frog Portage, near which the Churchill is joined from the north by the Reindeer River, was surveyed by Mr. Fawcett in 1888. It had first been ascended by some fur-traders from Montreal who afterwards combined to form the North-West Company and was regularly used as a trading route for many years to the Athabaska and Mackenzie River country. It contains numerous lakes separated by stretches of swift water containing falls and rapids, one of which, Snake Rapids, is over 1½ miles in length. The two largest lakes on this portion of the river are Clear Lake and Lake Isle à la Crosse, each over 35 miles in length. The chief disadvantage of this as a route to the Athabaska River is the famous Methye Portage, 12¼ miles in length, from Lake La Loche to the Clearwater River. The route was finally abandoned when, with the building of a railroad to Edmonton and a road from there to the Athabaska River, it was demonstrated that scows could safely be run down the latter to Lake Athabaska.

The next portion of the river as far as the outlet of Southern Indians Lake has been mapped by Mr. McInnes. Here again the river consists of a chain of lake expansions separated by stretches of swift water, in which numerous portages are necessary. The largest lake in this portion and indeed along the entire course of the river is Southern Indians Lake. It is 92 miles long and has a width of 15 miles at its broadest part. It contains many islands, and its shore-line is very irregular. On the early maps prepared from the track surveys of Peter Fidler the bays were united to form a lake with something corresponding to the true outline but showing an area much

[2] J. B. Tyrrell and D. B. Dowling: Report on the Country between Athabaska Lake and Churchill River, *Ann. Rept. Geol. Survey of Canada*, Vol. 8 for 1895, Report D, 1896.

William McInnes: The Basins of the Nelson and Churchill Rivers, *Geol. Survey of Canada Memoir No. 80*, 1913.

greater than it actually possesses. In fact the lake nowhere shows any great expanse of water.

The remainder of the river from Southern Indians Lake to Hudson Bay was the portion mapped during the summer of 1915. Access to the river was obtained from Split Lake on the Nelson River, over the portage route to the Little Churchill. From the mouth of the latter, the main Churchill was ascended to Southern Indians Lake. At only one or two places in this distance was any indication found that the river had formerly been used as a canoe route. A Hudson Bay axe-head at one place, an old cabin on Billard Lake, and some cuttings near Southern Indians Lake were the only signs of man which were discovered. For the numerous rapids and falls on this portion of the river there were, with but one exception, no signs whatever of any portage trails. The river in this distance is marked by three lake expansions, Northern Indians, Churchill, and Billard Lakes, several long, wide stretches of smooth water, and elsewhere by narrow swift reaches. In the latter are included four narrow chutes where the river contracts to a width of from 100 to 200 feet and plunges down between rock walls, five falls varying from 8 to 20 feet in vertical drop, numerous rapids necessitating portages, and stretches of swift water where pole and tracking line were continually in use.

Thirty miles below the mouth of the Little Churchill the granite-gneiss of the region disappears under a covering of horizontal Trenton limestone through which the river has cut its course. At places for a distance of 27 miles the river is bordered on either side by vertical and overhanging walls 60 feet in height. The current here is swift, but no rapids are encountered which cannot easily be run. It is probably this portion of the river which has given it such a bad reputation among the natives of the region. In the spring and early summer ice-jams undoubtedly occur in this part of the river and make it a dangerous portion to venture upon, but when descended late in August only a few patches of ice remained on the limestone cliffs. For late summer the Churchill is therefore much to be preferred to the Deer River route for a canoe journey to Fort Churchill.

The last stretch of the river flows in a northerly direction, and an interesting feature to observe is the change in vegetation as one proceeds from the wooded belt into the Barren Ground region; the trees become gradually smaller and fewer in number until at Churchill itself trees are practically absent.

In the last 20 miles the river is wide and shallow and contains many islands. The highest point affected by the tide is 12 miles above its mouth. Below this point the estuary has a width of 3 miles, bordered on either side by a ridge of quartzite. The Hudson's Bay Company post of Churchill and the Anglican mission are situated 5 miles from the mouth of the river on an old beach along the north shore of the estuary. Near the mouth of the river not far from old Fort Prince of Wales is situated the barracks of the North

FIG. 8.

FIG. 9.

FIG. 8—Port Nelson, September, 1915. When the railroad now under construction is completed, Port Nelson will become an important outlet for the shipment of wheat from western Canada to Europe via Hudson Bay.

FIG. 9—Hudson's Bay Company post of Fort Churchill.

FIG. 10

FIG. 11.

FIG. 10—Eskimos at their summer camp near Fort Prince of Wales.

FIG. 11—Chipewyan girls at Fond du Lac, Lake Athabaska.

West Mounted Police, while directly opposite is the large warehouse of the company. On the extremity of Eskimo Point at the mouth of the river still stands Fort Prince of Wales, with its dismantled parapets and guns.

Inhabitants of the Region

The inhabitants of the region consist of a few wandering Indians and a small number of Eskimos living on the coast. The Indians belong to two separate tribes, the Crees and the Chipewyans, and in a general way the Churchill River forms a boundary between their territories, the Crees living to the south and the Chipewyans to the north. All those who come to trade at Split Lake are Crees, those that come to Fort Churchill are all Chipewyans.

The Chipewyans belong to the great Déné stock, a name given to a group of tribes with linguistic similarities who occupy all the interior country west of Hudson Bay from the Athabaska River north to the region occupied by the Eskimos, and across the Rocky Mountains almost to the Pacific Ocean. A further idea of the wide distribution of this stock may be gained from the fact that the Navajos of Arizona, the Apaches of the plains, and the Hupas of California belong to the same branch. The Canadian tribes included among the Dénés are nine in number, of which the more important are the Chipewyans, the Dogribs, living between Great Slave Lake and Great Bear Lake, and the Yellow-knives, living northeast of Great Slave Lake.

The main region occupied by the Chipewyans is north of Lake Athabaska, and many more come to the trading posts of Fond du Lac and Chipewyan on that lake than to Fort Churchill. The writer has spent two seasons in the region north of Lake Athabaska and found it rather interesting to compare the habits of those at Churchill with those in the more typical region and to note the effect of environment on their mode of living. North of Lake Athabaska travel is by canoe over the numerous lakes and small streams. Three times a year the natives assemble at the trading posts, at Christmas, when they come in for religious service at the mission, again at Easter, and in June for treaty. The latter is an important occasion for the Indians. Every year the government pays each man, woman, and child five dollars in consideration for having taken over the country from them. The Indians never fail to assemble; and while they remain, the trading posts, with all the additional tepees, the great numbers of dogs, and the excitement of dancing and gambling, present a much more animated appearance than under ordinary conditions. The Indians remain until their treaty money is spent and the provisions which they have purchased with it are used up, and then they set out again in their canoes for their hunting and fishing grounds. The birch-bark canoe is still the type most in use, although many of the Indians now have wooden Peterborough canoes, purchased from the traders. The old-fashioned birch-bark possesses the advantage of extreme lightness, an important

consideration on journeys where long portages are an everyday occurrence. The type of dwelling used is the round tepee with its fire in the center. Instead of skins, however, canvas purchased from the stores is now generally used. Along their routes of travel skeleton tepees made of poles are a common sight; these can quickly be converted into a permanent camp by throwing the canvas around them. The diet of the Indians is almost entirely fish and meat. When they leave for their hunting trips they take with them a little flour and tea, but the former is soon consumed. Tobacco and ammunition are considered much more valuable cargo where bulk and weight must be kept at a minimum and where the women and even the small children are smokers. Ready-made clothing is now used almost altogether, but the universal footwear used among them is still the moccasin.

The Chipewyans who come to Fort Churchill number about one hundred and seventy. They remain all summer at the port fishing and hunting. Very few of them own canoes, since their method of travel, unlike that of the Indians of Lake Athabaska, is overland rather than along the streams; otherwise their customs and manner of living are much the same. In the fall, usually late in September, they all start for their hunting grounds with packs on their backs and their dogs loaded with as much as they can carry. Some of them travel as far as Reindeer and Shethnanei Lakes. Generally about three weeks before Christmas the men return to Fort Churchill by dog-team to trade their furs, leaving their families at their camps, and as a rule one or more trips are made again during the winter. Those who have seen them in their winter quarters say that when the caribou are plentiful they live in comparative comfort and are much at their best. In the spring they return to spend the summer at the fort. Their movements and manner of living are always dependent on the food supply.

During the summer some fifty or sixty Eskimos are always camped at Churchill. They live at the mouth of the river on Eskimo Point near old Fort Prince of Wales. In winter they go north to Chesterfield to hunt the seal and walrus.

Fauna

Of the animals of the Churchill River region the most important from the point of view of food is the Barren Ground caribou; large herds come south in winter as far as Northern and Southern Indians Lakes and as a rule they come close to Fort Churchill. Farther north on the Dubaunt River herds numbering many thousand animals were encountered by Tyrrell in July. Moose range as far north as the Churchill River. In 1915 one was seen at the extreme north end of Northern Indians Lake. In the same season quite a number of fur-bearing animals were also seen. Many wolves were observed along the river; some sixteen were counted during the summer. Ten black bears were also seen, besides two black foxes, several red

and cross foxes, and a number of mink and otter. Of other animals may be mentioned beaver, squirrels, chipmunks, and rabbits. Numerous geese were killed on the lakes and along the river. The large gray goose was particularly abundant. Of ducks the varieties noticed include golden-eyes, sawbills, mallards, and black ducks. Plover are fairly abundant and are eagerly hunted at Fort Churchill. Of fish, pike, goldeyes, doré, whitefish, and suckers are common in the lake expansions. One of the most important industries at Fort Churchill is fishing with huge nets for white whales, cetaceans averaging about 15 feet in length, which are quite abundant near the mouth of the river. Their blubber furnishes the supply of food for the dogs.

Vegetation

The trees of the region are all small. Black spruce is much the most abundant, but it rarely grows to a diameter exceeding eight inches. Tamarack and low juniper occur sparingly. Of the deciduous trees much the most common is poplar, of which two species, the aspen and the balsam, are found. White birch occurs sparsely, and both red and gray willow occur locally in dense thickets. Fort Churchill itself is on the edge of the Barren Grounds. The ridges of rock on either side are entirely bare except for a growth of moss and a few small trees in the depressions. The supply of wood is always a big problem at the post, and every year it is necessary to go farther for it.

Economic Conditions and Outlook

Fort Churchill has but little communication with the outside world. Once a year the steamer *Nascopie* arrives from eastern Canada, bringing in the annual supply of provisions. Its arrival is the event of the year, and the writer was fortunate enough to be present for this event after descending the river. In summer the only other way of reaching Fort Churchill is by the river route from Split Lake. In winter, however, the post may be reached by dog-team either overland from Split Lake or along the coast from Port Nelson. Two winter mails are obtained by the latter route from York Factory and Port Nelson.

There is little hope of the country's having any important future. Agriculture can never be important, and the timber is too small for a lumber industry. From the character of the geology of the region, little can also be hoped for in the way of minerals in the immediate vicinity of the river. The fur trade will probably continue to be the chief asset of the region. Should the new Canadian government railway, now under construction to Port Nelson on Hudson Bay, ever prove to be a valuable outlet to Europe for the grain of western Canada, it is entirely probable that the excellent natural harbor of Churchill will sometime be taken advantage of.

THE EARLY RELATIONS BETWEEN NEWFOUNDLAND AND THE CHANNEL ISLANDS

By H. W. LE MESSURIER, C.M.G.

In the English Channel, contiguous to the French coast, is a group of islands and rocks now known collectively as the Channel Islands, but in olden days as the Norman Isles.[1] The principal ones are Jersey, Guernsey, Alderney, and Sark. These islands are the only portion now remaining to England of that territory which formerly was known as the Dukedom of Normandy. The King of England is still held by the Channel Islanders to be Duke of Normandy.[2] The ancient history of these islands is most interesting, dating back to long before the Roman occupation of Gaul and the subsequent conquest of Albion.[3] The largest island of the group is reminiscent of the Roman invasion of Britain by Claudius in 43 A. D., for at that time it was named Caesarea, which has been corrupted into Jersey, and several places in the island are still known by immemorial tradition as "Le Fort de César," "La Petite Césarie," etc. Near the manor of Dielament one sees the remains of an ancient work, in the known form of a Roman camp.[4]

Although an appanage of the British Crown the people of these islands retain the old Norman laws; and the officials, with the exception of the Lieutenant Governor, bear the old Norman designations, and the laws are administered as in Norman days. The inhabitants retain many of the ancient customs, and nowhere in France will you hear more antique Norman spoken than in Jersey and Guernsey. One of the ancient usages still survives. When Rollo was Duke of Normandy, in order that peace and justice might be maintained in his duchy, his subjects were given the privilege that during his life, and after his death, whenever any of them were wronged or injured in their possessions they could obtain immediate aid by crying *Ha! Ro, Ha! Ro, à l'aide, mon prince, on me fait tort.* This cry may still occasionally be heard in the Channel Islands, and heed has to be paid to it according to the ancient laws.[5]

In former days and up to the nineteenth century, the people of these islands were great sea rovers. Many of them were engaged in the fisheries, and some traded to the Mediterranean and in the course of time followed the adventurous Portuguese down the coast of Africa and returned laden with spoil. As early as 1246 it is recorded that ships of Jersey and Guernsey

[1] Rev. Philip Falle: An Account of the Island of Jersey, Jersey, 1837, p. 278.
[2] *Ibid.*, p. 15.
[3] John Patriarche Ahier: L'Histoire de Jersey, Jersey, 1852.
[4] *Ibid.*, p. 71.
[5] Chron. de Normand, Chap. XXVI, Paris, 1711.

were engaged in the fisheries at Iceland, their catch being brought home and disposed of to the English and the French.[6]

It is an old tradition that fishing vessels belonging to Jersey, on their way to Iceland to engage in the summer fisheries, when nearing their destination were overtaken by a northeast gale which drove them southwest for some days until finally they fell in with a land whose waters teemed with codfish. They loaded their vessels there and then returned to Jersey. It was shortly after this that Cabot made his voyage of discovery in 1497, and it was always maintained by the old Jersey settlers in Newfoundland that Cabot learned from Jersey fishermen who visited Bristol of the western land that they had discovered. Be that as it may, it is a certain fact that the Channel Island fishermen were among the first, if not the first, fishermen to visit Newfoundland. It has been asserted by Jerseymen that a ship belonging to Du Moulin visited the harbor of St. John's in 1500, and at Bras D'Or and Blanc Sablon in Labrador fishing establishments belonging to Channel Islanders were in operation very early in the sixteenth century.

Rut, in the account of his voyage to the New-found-isle, relates that "on the third day of August, 1527, entered into a harbour called St. John's, and there we found eleven sail of Normands, one Breton and two Portugal barks, all a-fishing."[7] The Normands were no doubt the fishing people of the Norman isles, now known as the Channel Islands.

In the old Jersey records it is mentioned that in 1591 John Guillaume was fined by the Royal Court for selling in France the fish which he had brought from Newfoundland. They also inform us that by the end of the seventeenth century the Newfoundland-Jersey trade, which had brought a large amount of prosperity to Jersey, had declined, owing to the fact that Colbert, the prime minister of Louis XIV, had put a high duty on fish imported into France in foreign vessels. The trade revived, however, about 1730, and the period from that date to the French Revolution was a very prosperous one for Jersey and Newfoundland commerce. In 1731 there were seventeen vessels from Jersey engaged in Newfoundland trade; in 1732 there were twenty-four; in 1771 there were forty-five; and in 1785 there were fifty-nine vessels. Besides these Jersey vessels there were a number of Guernsey vessels engaged in the same trade.[8]

Harrisse, in his history,[9] notes that in May, 1591, the fishermen of Guernsey, through one Colin, applied to the municipality of St. Malo for permission to fish in Newfoundland, but were refused. This refers to that portion of the coast of Newfoundland which came under the jurisdiction of the French in 1662 by the secret arrangement made between Charles II and the French king, whereby all the southern coast of the island west of Cape St. Mary's was to be held by the French. The Guernsey and Jersey people

[6] Jersey Chronicles in archives of Jersey.
[7] Purchas His Pilgrimes, 1625.
[8] Falle: *op. cit.*, and Jonathan Duncan: The History of Guernsey, London, 1841.
[9] Henry Harrisse: John Cabot, the Discoverer of North America, and Sebastian, His Son. London, 1896.

had, prior to 1662, fished in Placentia and Fortune Bays, and the Villeneuves had a fishing establishment at Placentia before the French occupation. Jersey Side in Placentia Bay is the only reminder left of the fact that a fishing firm from the Channel Islands once occupied this spot.

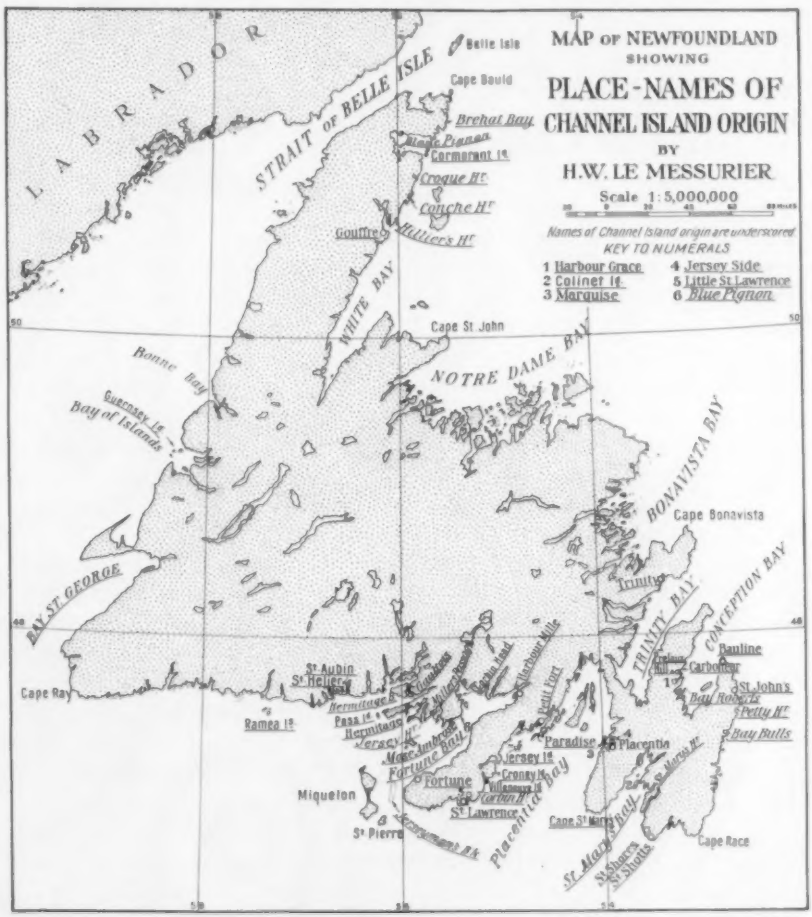


FIG. 1.

History, as it deals with the discovery of America, gives us records of certain expeditions which sailed from the Old World to search for and discover lands in the west. Each expedition was fitted out at the expense of one of the crowned heads of the maritime states of Europe, and their doings were fairly chronicled, but no account was taken of the venturesome fisherman or trader who sailed away in pursuit of the wealth of the seas and the accumulation of riches by trading with the barbarians or savages of

little known lands. Yet there is often a record left in the names of places which tells us of the people who first discovered the harbors, capes, rivers, etc., of a new country, although it may not be chronicled in history. As Canon Taylor says,[10] "the name of a district or of a town may speak to us of events which written history has failed to commemorate." That many of the names of places in Newfoundland were given by the people of the Channel Islands proves that it was very early known to, and occupied by, these adventurous fishermen.

It has in recent years been asserted by two writers[11] on Newfoundland that John Cabot discovered and named St. John's, the capital of Newfoundland, on St. John's day, 1497, the date on which he first saw the land of America. On an examination of the account of John Cabot's voyage I fail to find any authority for this assertion. It has also been contended by these writers that Cape Bonavista was the landfall of Cabot, and Judge Prowse, the author of the "History of Newfoundland," vigorously maintained that this was the case and relied very strongly on tradition.[12] Messrs. Harrisse,[13] Dawson,[14] Biggar,[15] and others, however, do not agree with Judge Prowse and argue that Cape Breton was the land first seen by Cabot. In his article on John Cabot in the Encyclopædia Britannica,[16] as well as in his "Voyages of the Cabots,"[17] H. P. Biggar speaks of the landfall of Cabot as some place on the American continent, and not Newfoundland. If Newfoundland was not the landfall of Cabot, he could not have discovered and named St. John's on St. John's day, 1497.

But supposing that Cape Bonavista was the landfall of Cabot, we have it on record that he made the land, with a large island lying off it. There is no large island lying off Cape Bonavista nor off St. John's. Cabot had been at sea for fifty-seven days in a caravel of fifty tons, and it is certain that when he made the land he would at once seek anchorage to obtain wood and water and proceed to clean his ship. In those days, when anti-fouling paints were unknown, vessels' bottoms had frequently to be cleaned during a long voyage. Moreover we are told that Cabot did land and that after he landed "the Royal Banner was unfurled and in solemn form Cabot took possession of the Country in the name of King Henry VII. . . . Having taken on board wood and water, preparations were made to return home as quickly as possible, and he sailed North three hundred miles."

St. John's lies eighty miles south of Cape Bonavista; if Cabot had

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[10] Isaac Taylor, Canon of York: Names and Places, Rivington, London, 1864, 1865, 1873.

[11] The late D.W. Prowse and the late Archbishop Howley in Newfoundland newspapers and magazines.

[12] D. W. Prowse: A History of Newfoundland from the English, Colonial, and Foreign Records. London, 1895.

[13] Henry Harrisse: work cited in footnote 9.

[14] S. E. Dawson: The Voyages of the Cabots in 1497 and 1498, *Trans. Royal Soc. of Canada: Section II*, Vol. 12, 1894, pp. 51-112.

[15] H. P. Biggar: The Voyages of the Cabots and of the Corte-Reals to North America and Greenland *Revue Hispanique*, Vol. 10, 1903, pp. 485-593.

[16] 11th edit., 1910-11.

[17] See footnote 15.

landed at Cape Bonavista and sailed north he could not have made St. John's; if he had sailed south instead of north he could not have reached St. John's on St. John's day. St. John's was not named on any of the early charts; it first appears in a chart by Desliens[18], 1541, and the name was first recorded by Rut. Who then gave that name to the place? And why should Rut in 1527 speak of it as though it had been known and so called for some time? I have no doubt that the name, like many names around the coast of Newfoundland, was given by some of the rovers of the Channel Islands, most likely by a Jerseyman from the parish of St. John's in Jersey.

On the northeast coast of the island of Jersey there are three places lying near each other and in the order named, viz:—St. John's Bay, Petit Port, and Bouley Bay. Can it be mere coincidence that in Newfoundland we have St. John's Bay, wherein the harbor of St. John's is situated, Petty Harbour, and Bay Bulls (formerly written Boulee Bay and so appearing on the old charts), all contiguous and following in the same order as the Jersey places? I submit that this evidence is strong enough to warrant the opinion of Channel Islanders that a Jerseyman named these three places St. John's, Petty Harbour, and Boulee Bay.

Jersey is divided into twelve parishes, viz:—St. Owen's, St. Peter's, St. Brelade's, St. Lawrence's, St. Mary's, St. John's, St. Hillier's, Trinity, St. Martin's, St. Saviour's, Grouville, and St. Clement's. Many of these names are prominent in Newfoundland, especially in the names of bays and inhabited places, such as St. Mary's, St. Mary's Bay, St. Lawrence, St. John's, St. John's Bay, Trinity, and Trinity Bay. It may be said that these names were universally used by French, Spanish, and Portuguese discoverers in naming the new places that they found, but I am strongly of opinion that surrounding circumstances and early occupation by Channel Islanders prove that the names originated with them.

On the northeast coast of Newfoundland the majority of places have French names. It is difficult to say whether the French are responsible for any of them, but many are undoubtedly Channel Island names. Brehat Bay, on the eastern shore of the long, narrow peninsula in the north, is one, and no doubt reminded a Channel Island fisherman of the place where he moored his fishing vessel during the months of winter. In the islands of Jersey and Guernsey in those days there were no safe winter harbors or mooring places, and Brehat on the Norman coast, southwest of Guernsey, was used almost exclusively by the Channel Islanders as a wintering port for their vessels. Farther along we find Conche and Croque, two ports near together. Croque is the name of a place and of a point on the northwest coast of Guernsey, and La Conchee lies just off the point. Gouffre is a name to be found both in Jersey and Guernsey, as Le Gouffre. The harbor now known as Hilliers was originally called St. Heliers, the name of

[18] Nicholas Desliens of Dieppe.

the principal town in Jersey. Blanc Pignon is also of Jersey origin, as is Cormorant; as no such bird as a cormorant was ever found in Newfoundland, this island is probably named after a similar island rock lying off the coast of Jersey.

Turning now to the southeastern extremity of the island, we find in Conception Bay many places the names of which are evidently of Channel Island origin. The names Harbour Grace and Carbonear do not appear on any maps prior to 1700, and some of the old names such as Frillon and Cape L'Argent have disappeared. Carbonear is a corruption of Charbonier, which was the name given to it by the Jerseymen, as they had charcoal pits there at a very early period. A letter written by an old Jersey lady early in the eighteenth century speaks of "Charbonier," referring to Carbonear. This letter was written to a gentleman living at Harbour Grace and was in the possession of his family until quite recently. At Mosquito Cove near Carbonear there was a Jersey establishment very early in the history of Newfoundland.

These fishing establishments were called "rooms,"[19] and it is quite usual in this country to speak of them as "Jersey rooms," no matter whether the proprietors belonged to Jersey or Guernsey. Harbour Grace is no doubt an Anglicization of Havre de Grace and was not named by the French, as they never resorted to Conception Bay either for fishing or for settlement, but it is a well-known fact that at a very early period two Jersey firms had fishing establishments there. The ground on which the Post Office stands and the land adjacent belonged to the Gushue family from time immemorial and was known as the "Jersey room." Gushue is a corruption of Guizot, the name of a well-known Jersey family. As a proof that the Gushues were originally Guizots they can show a piece of plate with the name Guizot on it, which has been handed down for generations. Near the waterside of this property was a large rock in which an iron ringbolt was fastened, used in mooring ships, and on it were cut names and letters in old Jersey style. The De Quettevilles had an establishment on the south side of Harbour Grace, also known as the "Jersey room," very early in the sixteenth century. The house in this property was called the Stone House and was built of freestone quarried at an island in the bay. Only the foundations now remain. Peter Le Seour, who was a convert to Methodism by Coughlan and who afterwards introduced Methodism into Jersey in 1770, carried on a business at Harbour Grace.

Bay Roberts was originally Bay de Roberts; the Roberts were a Jersey family. A prominent hill in this place is still called Prelaux Hill, after two Jerseymen who lived there. Near the southeast point of Conception

[19] A fishing "room" consisted of owner's or agent's house; shop and store; warehouses for storing fish; cookroom (a building in which the shoremen, that is the laboring men working on shore at the curing and shipping of fish, lived); cooperage; forge; sail and net lofts; stages, or places in which the fish was landed, split, and placed in salt; flakes (erections on which the fish was spread to be dried after being in salt for a certain time); etc.

Bay lies the little fishing village of Bauline; there can be no doubt that the original name was Baleine, after a place in the island of Sark which it very much resembles. The names of many of the inhabitants of Conception Bay are reminiscent of the Channel Islands. Gushue (Guizot), Puddister (Poingdistre), Pasher (Perchard), Hookey (Le Huquet), Le Grow (Le Gros), Fillier (Filleul), Hawcoe (Hacquoil), Nichol (Nicolle), Piccott (Picot), Furey (Le Huray), Norman, Noel, Le Drew, Gosselin, Grouchey (Gruchy), Murrin (Mourant), Cernew (Quenault) are names peculiar to Jersey and Guernsey and prove the descent of these people, although many of them have no knowledge of where their forefathers came from. It cannot be argued that they are of French descent, as no French ever settled in Conception Bay or resorted there for fishing, and the people who bear these old Norman names have been settled there for generations.

On the south coast of Newfoundland there are many more Channel Island names among the inhabitants. St. Mary's Bay, Cape St. Mary's, St. Mary's Harbour, and Colinet are names peculiar to Jersey. The Nicolles of Jersey, early in the history of Newfoundland, had a fishing establishment at St. Mary's Harbour. St. Mary's was probably named by them after the parish of St. Mary's in Jersey, and the bay in which the harbor was situated and the cape at its western entrance took their names from that of the principal harbor.

At the eastern entrance to this bay there are two places now called St. Shotts and St. Shores which formerly were named St. Jacques and St. George. The French pronunciation of these two names is responsible for the corruption. These two points might have been named by the French, but it is not likely that they would have called a place after the patron saint of England, whereas the Channel Islanders would. In Placentia Bay, at Placentia, the old French capital, the Villeneuves of Jersey had a fishing establishment long before the French occupation, as previously noted in this article. From there they moved to Burin and established a business which was continued uninterruptedly by Jersey firms until a few years ago. Marquise, between Placentia and Argentia, is probably named from La Marquise in Guernsey. On the west side of Placentia Bay, we have Paradise from Paradis on the Guernsey coast, Petit Fort from the same source. Jersey Island lies outside of Rushoon and Bain Harbour. Croney Island off Beau Bois is Gros Nez. In Burin, at the entrance to the cove where the Jersey premises are situated, lies an island known to past generations as Villeneuve Island after the Jersey family which removed from Placentia about 1680. Corbin Island and Harbour a few miles southwest of Burin bear a well-known Jersey and Guernsey name. At Little St. Lawrence the Jersey firm of De Grouchy, Nicholle & Co. had a thriving establishment. A drawing of the island on which the principal buildings were established appears in the diary of the Duke of Clarence (afterwards William IV), who visited this place in H. M. S. *Pegasus* in 1786. St. Law-

rence was probably named after the parish of St. Lawrence in Jersey. Lying off the eastern point of Fortune Bay is Jerseyman's Bank, and twenty-five miles inside the point is Fortune, evidently named by a Jerseyman after Fortunée in Jersey. Farther in the bay is Harbour Mille (pronounced Millay). In Jersey there is a place called Millais and several families of that name. There is a place called Corbin on the west side of the bay which is both a Guernsey and Jersey name. Blue Pignon is evidently Blanc Pignon, after the place of that name in Jersey. Miller's Passage is a name which is evidently a corruption, as no person of the name of Miller ever lived in the neighborhood or was known to have been there. Jersey Harbour was the nearest inhabited place in the early days, and it is probable that Mouilliérs, after the Jersey name, was the original designation. To show how names have been corrupted, that of a place near Miller's Passage is now known as Mose Ambrose; the original name was Mon Jambe. Jersey Harbour was named by Jerseymen. Pass Island was originally Passee Island, whether called after Passee in Guernsey or *passe*, meaning a channel, it is hard to determine; the old French charts give Passee, which does not mean a channel. In French *passe* means pass, channel; *passé*, beyond; *passée*, a passage of troops. The name of Pass Island was written Passee without any accent marks. We now come to Hermitage and Hermitage Bay. When this place was named there were no people in Newfoundland excepting the aboriginal Indians. There is only one way of accounting for the name, and that is that it was called so by a Jerseyman who saw in an island off Hermitage a resemblance to the Hermitage in Jersey off the port of St. Helier.

There can be no doubt that the people of the Channel Islands early settled along the south coast of Newfoundland, the family names of these people occurring frequently from St. John's to Cape Ray. Messervy, Clement, Payn, Tessier, Le Messurier, Grandy (Grandin), Lesbirel, Dumaresque, Le Feuvre, Hulon (Huelin), Ayre (Ahier), St. Croix, Cabot, De la Cour, Le Grand, Renouf, Berteau, Du Tot, Le Marquand, Le Drew, Bonnell, Knights, Hue, Lambert, Sacrey, Bisson, Beaucamp, Chevalier, Vautier, Le Moine, Le Fresne, Corbin, Le Roux, Carey, Le Scelleur, Sorsoliel, Frewing, Angot, Pinel, Ereant, La Fosse, Le Quesne, Falle, Le Riche, Vaudin, La Rasignoll, La Blanc, Tupper, Havilland (Du Havilland), Fashon (Fashion), Dobree, Thomey (Thoume), Ozanne, Tibbo (Thibault), and Siviour are among the names peculiar to Guernsey and Jersey which designate many of the inhabitants in the settlements of Placentia, Fortune, and Hermitage Bay and along the coast to Cape Ray. In Hermitage Bay is a place called Gaultois. The original name was an old Norman word, Galtas, which means "like a pinnacle or dormer"; the place itself has several pinnacles and is well named. There has been much controversy about the name Ramea given to a number of islands which lie southwest of Burgeo; it has been written in various ways, Ramie, Ramée, and Ramea.

Le Ramée is the name of a place in Guernsey, *rames* is an old Norman word for wild vetches, and vetches are to be found in all these islands. In all probability the name Rames was given to them because of the quantity of vetches found there. At Rencontre, east of the Ramea Islands, there are two hills, at the mouth of a small bay, which are called St. Aubin and St. Helier after two towns in Jersey.

On the western coast of Newfoundland, Bay St. George was probably named after the parish in Guernsey of that name, and the island of Guernsey at the entrance to Bay of Islands was named by a Guernsey Islander.

In the foregoing I have endeavored to show the intimate connection which the people of the Channel Islands have had with the early history of Newfoundland. So far as I know this subject has not been dealt with by historians; in fact, our local authorities Pedley,[20] Harvey[21] and Prowse[22] in their histories completely ignored the Jersey and Guernsey men, although in their time the remembrance of some of the old Jersey "rooms" was quite fresh, and some of the Jersey firms were then in existence. The De Quettevilles, Clements, Renoufs, Le Messuriers, Payns, Falles, Berteaus, De Grouchy, Nicolls, Villeneuves, all had at one time establishments, the places of which are as well known today as they were one hundred years ago.

Before concluding I wish to note that the Jersey people had an early connection also with the continent of America.[23] The state of New Jersey, in the United States, was a portion of that tract of country lying between the Connecticut River and the eastern side of Delaware Bay as well as all the islands between Cape Cod and the Hudson River, which Charles II had bestowed upon his brother James on the 12th of March, 1664. To this tract the name of Nova Caesarea,[24] or New Jersey, was given, in honor of Sir George Cartaret of Jersey, who governed the isle from 1643 to 1651 and there entertained Prince Charles during his exile from England. The Duke of York subsequently transferred to Lord Berkeley and Sir George Cartaret of Jersey all his new possessions.

Another curious fact, which marks the early connection that the Channel Islanders had with America and their knowledge of the intercourse with the Indians, is that while the French word for tobacco is *tabac*, the Channel Islanders called it *ptun*, the name of a very old Indian tribe of America which, until very lately, was supposed to be extinct. This word is still in use in the Channel Islands.

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[20] Rev. Charles Pedley: The History of Newfoundland from the Earliest Times to the Year 1860. London, 1863.

[21] Joseph Hatton and Rev. M. Harvey: Newfoundland, the Oldest British Colony: Its History, Its Present Condition, and Its Prospects for the Future. London, 1883.

[22] Work cited in footnote 12.

[23] Article "New Jersey," Encyclopædia Britannica, 11th edit., 1910-11.

[24] Caesarea was the name given to the Island of Jersey by the Romans. Jersey is a corruption of Caesarea. See Falle's history (cited in footnote 1), p. 2.

OUR IMMIGRANT PROBLEM: A DISCUSSION AND REVIEW

By ELLSWORTH HUNTINGTON

During this strange period when war checks the stream of new citizens who usually swarm into the United States, we are thinking of immigration in a new light. On the one hand, we hear the insistent call of manufacturers for more laborers and of housekeepers for cheaper servants. On the other, the voice of the laborer is heard rejoicing because his wages are increasing and his standard of living is rising. Such conditions, however, are no more than the foam on a wave of temporary prosperity. They neither prove that immigration is desirable nor that it is undesirable. If we would discover the best immigration policy we must shut our ears to the deafening clamor of the immediate present and must listen to the record of what has actually happened in the past and see what it promises for the future when viewed in the light of science.

Three recent books[1] present an interesting epitome of the problem of race and immigration as it confronts the United States today. All three consciously or unconsciously emphasize racial traits. Although utterly different in method and purpose they agree in showing that our attitude not only toward the new immigrant but toward the people of diverse races already in our midst must ultimately be decided on the basis of expert judgment as to the respective parts played by heredity and environment. We have tried to make good citizens by means of religion, education, good government, sanitation, and philanthropy, not to mention other things. We have been sure that opportunity was all that is needed to make useful citizens out of almost any race. Of late, however, the students of eugenics have made us realize as never before that the main body of a stream can never be higher or purer than its source. If our immigrants are dull of mind and weak of will, our citizens will possess the same qualities. It is also beginning to dawn upon us that human energy is one of the main foundations of human character and that energy depends upon physical environment even more than upon social environment and training. Evidently the problem of immigration can never be solved until we add to our present efforts a full knowledge both of the part played by inheritance and of the degree to which inherited traits can be modified by physical environment. For the present, however, let us confine ourselves to heredity, since that is the phase of the problem which demands the most immediate and

[1] C. V. Roman: American Civilization and the Negro: The Afro-American in Relation to National Progress. F. A. Davis Co., Philadelphia, 1916.

Samuel Joseph: Jewish Immigration to the United States from 1881 to 1910. *Columbia Univ. Stud. in Hist., Econ., and Public Law*, Vol. 59, No. 4, 1914.

E. A. Ross: The Old World in the New: The Significance of Past and Present Immigration to the American People. Century Co., New York, 1914.

drastic action. Let us see to what conclusions we are led by a study of the three books under review.

The first book is "American Civilization and the Negro," by Doctor Roman. It deals with the first great immigration to America by people who are not largely Anglo-Teutonic in race. Perhaps we should not call the negroes immigrants, for their ancestors came to this country almost as early as those of any of us, but at any rate they still differ from the rest of us so much that they present a problem like that of more recent arrivals. In attempting to discuss Doctor Roman's book I find myself considerably embarrassed because the thing that interested me most in reading it was race psychology as represented by the author and reviewer. Perhaps the best way to give the reader a fair idea is frankly to relate my own experience. After reading forty or fifty pages I turned back to the title page and pondered on it. The book was interesting, and I sympathized deeply with its general purpose. Nevertheless, I was puzzled that an ex-President and Editor of the National Medical Association should drag in so many big words by the heels, only to explain them in footnotes, or in an ample glossary at the end. I was surprised by the abundant italics and innumerable quotations. The quotations were admirable in themselves, but I could not help feeling that they were overdone. It seemed almost as if the author had sorted his notes into groups and found a place for everything. This method and the author's strong tendency to digress and to philosophize aroused in my mind a certain impatience, which was intensified by the author's habit of setting up men of straw and battering them unmercifully. "Why fight with the windmills?" I asked. "No one denies that the white man's ancestors were savages, that many modern white men are beasts, or that millions of good negroes are far superior to millions of bad white people." Yet in spite of the impatience aroused by the method and style of this book every thoughtful person must feel strongly that Doctor Roman is fundamentally right in his plea that colored people should be judged as individuals and not as a race. We judge white men that way. Why not be equally fair to colored people?

After reading seventy pages with thoughts like these I suddenly discovered what I doubtless should have realized before, namely, that the National Medical Association is not the American Medical Association but a colored organization. My attitude changed at once. Instead of the impatience which had inclined me to drop the book or else to write a stinging review, I felt strong sympathy for the author's brave attempt to obtain for his race that justice which we white men still deny. The minor matters which had aroused my critical instincts no longer seemed important. My own change of heart on discovering that Doctor Roman was a negro was at first most disconcerting. It made me realize that although I am glad to meet a negro on the same terms as a white man of similar character and although I have great confidence in the future growth and achievements

of the colored race I am nevertheless racially biased. In spite of myself I judge the negro by a standard different from that which I apply to white men. The difference is that the standard is far more lenient for the colored race than for the white. A book which I should score severely if written by one of the leading white physicians of the country I am inclined to praise when written by a leading colored physician.

If Doctor Roman is right, this attitude is a grave injustice to the negro. The keynote of his book is that white men and colored men are alike. The white man may be ahead of the colored, but the difference is in degree, not in kind. Doctor Roman's own book suggests something of quite a different sort. Of course there are negroes who can write books like those of the white man. Yet there remains the subtle fact that even the best friends of the negro do not expect from him the same sort of work as from a white man. No matter how well he has been educated or how fully he has identified himself with white civilization we expect that even the scientific colored man will differ from the scientific white man much as an artist differs from an engineer. Each is superior in certain respects, but they are emphatically not alike. In a book about bridges by an artist we applaud things which we should frown upon if stated as the conclusions of an engineer. In other words, taking the colored race as a whole we expect—and I believe that the negro himself expects—that his work will be tinctured with an element of emotion which we do not look for in other races.

Doctor Roman's book is an emotional appeal, humorous, eloquent, and pathetic by turns, but it is never a scientific argument. He quotes the old saying that there are three kinds of lies—"lies, damned lies, and statistics." He avoids all three, but has a special abhorrence for the last. Therefore he is inconclusive. Yet he clearly sees the fundamental issues in the race problem. These may be summed up in two questions, biological and geographical. (1) Biologically, are there permanent racial differences which cannot be eradicated either by environment or by education and culture? Doctor Roman answers "No." (2) Geographically, does a race change its innate characteristics under the influence of a new geographical environment? Doctor Roman believes that in the new environment of the southern United States the Anglo-Teutonic white man on the one hand and the African negro on the other, even when they remain racially pure, are tending away from their ancestors toward an intermediate type resembling the American Indian. His own medical practice among colored people in Tennessee convinces him of a tendency away from the diseases that have been regarded as especially characteristic of the negro and toward those characteristic of the white man.

The Jew and the negro are strangely alike and strangely different. They are alike because both races have been subjected to the most cruel injustice and oppression. It is probably safe to say that during the century preced-

ing the emancipation of the slaves in America the Russian Jew suffered as much oppression as the negro. If we include the northern negroes there probably was scarcely more illiteracy among the colored people than among the Jews. During the half century since the emancipation of the negroes, however, their opportunities have been greater than those of the Russian Jews. The differences between the two races are much more marked than the resemblances. One race has come here to escape oppression, the other was brought to endure oppression; one is a race acutely proud of its supposed biological differences from other races and eager to emphasize them, while the other tries to appear as like the European races as possible. The Jew herds in cities, while the negro works on the farm; the Jew takes pride in assertiveness, while the negro may well take pride in his power to make merry in spite of hardships.

Because of this strong racial contrast it is interesting to compare Doctor Joseph's book on "Jewish Immigration to the United States" with Doctor Roman's book. Each is a book by a member of a highly specialized race in which he attempts to show what his race has done and how it is related to American civilization. Each is the kind of book that one would expect from an able member of the respective races.

Doctor Joseph's book is crammed with statistics and facts. It contains scarcely a statement that the most ardent critic would question, and everything is treated with absolute logic. It is the book of a member of a race which is sure of itself and its achievements and which feels no need of appealing to the rest of mankind when once it is given the chance which America affords. Nevertheless, one does not read this book with the interest that one has in Doctor Roman's work. There is nothing to cause a smile, to arouse an emotion, or to stimulate new investigation. The book first takes up the recent history of Russia, Rumania, and Austria in relation to the Jews. It shows how recent progress has aroused the non-Jewish population to the point where they have begun to be competitors with the Jews as skilled artisans and merchants. This has combined with fanaticism to cause anti-Jewish activities which have been relatively mild in Austria, but have taken the form of extremely repressive laws in the two other countries, and even of *pogroms* in Russia. The severity of the anti-Semitic activity is closely reflected in the number of Jews who come to America. Under persecution not only does the number of Jewish immigrants greatly increase, but the proportion of women and children increases still more. This proportion is at all times larger than among other races, which shows that the Jews come here to settle permanently. Abundant statistics in the text and long tables at the end of the book show the exact condition of the Jewish immigrants, their occupations, and their destination. The proportion of "skilled" laborers is larger than in any other important group of immigrants. A third of all who come are tailors, who usually settle in New York.

Doctor Joseph's book brings the Jews to us, as it were, but it offers no light on the serious question of whether the Jews are going to become part and parcel of the American people, or whether they are going to remain aloof and thus constitute a problem.

After reading the books of Doctor Roman and Doctor Joseph one cannot but wonder how extensively we are still introducing into our country elements which in spite of the new environment will retain their old characteristics as tenaciously as do the negroes and the Jews. Professor Ross in his interesting book on "The Old World in the New" attempts to answer this question. In the character of his book and in his racial inheritance, which is Anglo-Scotch-Irish-American, he stands between the two other authors. His book deals freely with statistics, but it also strengthens its hold on the reader by humor and emotion. It arouses opposition, as may be judged from the fact that both Doctor Roman and Doctor Joseph question some of its statements, but it is also highly suggestive and leads the reader to think and investigate for himself. It is so interesting that it should be widely read. One by one it takes up the different immigrant races and briefly and cleverly characterizes each. It lays strong emphasis upon the value of heredity and points out that the descendants of the early Puritans, Huguenots, Scotch-Irish, Quakers, and others who came with high purposes have done far more than their share in contributing the people who today by ideals and by power of concentration are leading the country. The way in which the more recent immigrant types are described may be illustrated by the Irishman. Statistics show that he is more apt than others to become a pauper, but to offset this he stands close to the top in the virtues of morality and family loyalty. His sins are apt to be those of kindliness. That is why he is a political boss. He really wants to help "the boys," and when one of them once gets a job he cannot bear to turn him out. In a large factory this quality of friendliness is apt to make him the superintendent or foreman, while the German is much more likely to be the scientific expert, and the American of the older stock the financial head and the determiner of policy. The Scandinavians are pictured as in some ways the antithesis of the Irish. After Bridget has worked in the family five years and goes away to set up a home of her own, she comes around occasionally to ask after the "childther," but Frieda takes the money that she has carefully saved, and is never heard of again.

In this pleasant vein Professor Ross gives a picture of one race after another. One feels that the pictures are perhaps too impressionistic, but they are certainly suggestive. The author feels keenly the deterioration in the type of immigrants who are coming to us. The immigrants of today come from less competent classes than those of a generation ago. Doctor Joseph also brings this out, although he shows that it is less true of the Jews than of most races. Professor Ross believes that no greater danger besets our country than our present plan of practically unrestricted

immigration. We apply a few tests for health, but for the infinitely more important matter of mental and moral fitness we apply no tests whatever.

The three books here reviewed epitomize our immigrant problem. They show that it is utter folly to attempt to determine upon an immigration policy without the most careful study of the laws of heredity. It answers no purpose to say that we do not believe in heredity; it merely shows lack of familiarity with scientific investigations. As Doctor Davenport has well said we all believe in heredity. We prove it every time that we buy a packet of seeds marked *double* petunia, *scarlet* sweet peas, or *yellow* bantam corn. The fact that we buy these seeds proves that we have such confidence in heredity that we know that the special characteristics named outside the package will appear months later in our gardens. Few, if any, biologists deny that man is subject to the same laws of heredity as are animals, and that the mind is as much influenced by inheritance as is the body.

In spite of the agreement of biologists as to the reality and importance of mental as well as physical differences among the races of men, we are scarcely able as yet to define exactly what qualities belong to each race. Hence it is doubtful whether we show wisdom in excluding some races and admitting others. We are thereby doing the very thing that Doctor Roman justly arraigns us for. We are accepting the idea that certain races are inferior to, or at least are so inherently different from ourselves that it is better that they should not live among us, but we are overlooking the fact that the differences between individuals of the same race are enormously greater than those between races. Our immigration laws are as inadequate as if we believed that a family of stupid peasants from eastern Europe may in a few years develop into people of the caliber of the settlers at Plymouth. Can our country stand the strain of such an immigration policy? Do we know whither it is leading us? As yet we have scarcely begun to collect and analyze the vast body of statistics that are needed for an intelligent understanding of the biological and geographical questions involved in immigration. If the books here reviewed prove anything, they prove that our first step should be a stringent and effective regulation of immigration so that for ten or twenty years we may be sure that we are admitting none except those whose inherent capacities make them fit to share our citizenship. Such a policy would at least keep us out of danger. It would give an opportunity for some well-equipped and permanent agency to begin a far-reaching study of the mental and moral characteristics with which various types of immigrants are permanently endowed by heredity and of the changes which occur in immigrants under a new environment.

GEOGRAPHICAL RECORD

AMERICAN GEOGRAPHICAL SOCIETY

Monthly Meeting of November. The regular monthly meeting of the American Geographical Society was held on Tuesday, November 21, at the Engineering Societies' Building, 29 West Thirty-ninth Street. President Greenough presided. The President congratulated the Society on the highly satisfactory response which had been received to the invitations to Fellowship in the Society extended to a selected list of people throughout the country instead of, as heretofore, chiefly to residents of New York and vicinity.

He thereupon submitted for confirmation the names of 1,118 candidates, each of whom had been approved by the Council, and they were confirmed by the meeting as Fellows of the Society.

The lecture for the evening was entitled "Exploration in the Upper Amazonian Valley," by Harriet Chalmers Adams, F.R.G.S. Mrs. Adams gave a highly entertaining description, illustrated by exceptionally good lantern slides, of the eastern slopes of the Peruvian Andes and the adjacent plains, together with an account of experiences among the forest tribes of the region.

NORTH AMERICA

Conservation of Bird Life in North America. Since the commencement of reservation work by the National Association of Audubon Societies in 1902 the conservation of bird life has made great advancement in the United States. Its status was discussed by Dr. T. Gilbert Pearson in an address before the seventh annual meeting of the Conservation Commission of Canada (*Report of the Seventh Annual Meeting*, Montreal, 1916). Reservations now number about seventy. They are scattered over the country from the gull and tern refuges of the Maine coast to the egret asylums of Florida. Along the great migratory route of the Mississippi is a long line of them —the valley from St. Paul to Memphis, the sunken lands of Arkansas, and the swamps of Louisiana. But they also extend farther afield. In the Yukon delta is a reservation larger than the state of Connecticut. Another takes in the western group of Hawaiian Islands; it was raided by Japanese feather-hunters in 1915. The Pribilof Islands shelter birds as well as seals, and the latest and one of the most notable additions to the list is the Canal Zone, an important winter station for migratory birds from the United States. The society is carrying out a vigorous propaganda in Alaska, a region gaining in interest from the conservation point of view as Canada is pushing forward its northwestern frontier of civilization. Yet the Dominion, with vast stretches of land unfit for agriculture, has unusual opportunities for conservation. Of the regions particularly calling for the establishment of reservations is Labrador, where the decimation of bird life lamented by Audubon three-quarters of a century ago is still progressing.

Joint action between the Dominion and the United States will undoubtedly contribute to the progress of bird conservation on the continent as a whole, and it is satisfactory to note that the bird migration treaty pending between the two countries promises to be ratified before long.

The Correct Name of Lassen Peak. The recent eruptions of Lassen Peak (see in part R. S. Holway: Preliminary Report on the Recent Volcanic Activity of Lassen Peak, *Bull. Amer. Geogr. Soc.*, Vol. 46, 1914, pp. 740-755, reprinted from *Univ. of California Publs. in Geogr.*), have brought this most active and interesting volcano of the United States into the public eye. The newspaper despatches frequently refer to it as "Mount Lassen," evidently in conformity with the names of other well-known peaks, such as Mount Shasta and Mount Rainier. The form "Lassen Peak" is, however, the one that has been in general use by scientific writers from the time of the Geological Survey of California under Professor J. D. Whitney in 1865 to the standard "Geomorphic Map of California and Nevada" published by the Earthquake Investigation Commission in 1908 (for comment, see *Bull. Amer. Geogr. Soc.*, Vol. 47, 1915, pp. 233-234). This usage was given official sanction by a decision of the U. S. Geographic Board on October 9, 1915. The same form occurs in the titles of two reserves previously created with the peak as a nucleus, the Lassen Peak National Forest and the Lassen Peak National Monument. The most recent creation, Lassen Volcanic National Park, omits the generic noun.

The peak and the adjoining county in California are named after Peter Lassen, a sturdy pioneer who guided many an early settler into the Sacramento Valley. A small crumbling monument thirty miles from the peak marks his last resting place. "In the early days of the Pacific Railroad surveys some pious monk called the peak St. Joseph's mountain, but the names Lassen's Peak and Lassen's Butte soon came into general use. Whitney has shown the inappropriateness of the French term *butte*, which, translated exactly, means knoll. As Lassen never owned the mountain, in later years the possessive form of the name was dropped," thus establishing the present form (*U. S. Geol. Survey Press Bull. No. 294*).

In this connection it may not be amiss to recall that Lassen Peak lies in the Cascade Range and not in the Sierra Nevada. Many general works of reference extend the Sierra Nevada northward to the Klamath River, to include Mount Shasta. This, however, is an arbitrary boundary. The dividing line between the volcano-topped Cascades and the tilted and complex fault-block, made up chiefly of ancient rocks, which constitutes the Sierra Nevada lies along the North Fork of the Feather River, as shown by Diller (*U. S. Geol. Survey 14th Annual Rept.*, Part II, Pl. 40).

Fog and Water Supply in California. A note by W. G. Reed (*Monthly Weather Rev.*, 1916, p. 288) calls attention to the importance of fog in providing moisture for vegetation in the California coast region in summer. The close relation between the occurrence of summer fog and the redwood is well known. Single trees, as on the Berkeley Hills of the Coast Ranges, drip with moisture during summer fogs. Although the ground away from the trees is dry, the grass under the trees is green, and the ground is moist to a considerable depth. R. DEC. WARD.

Revival of Iron Mining in the Adirondacks. The opening of the Champlain branch of the New York State Barge Canal and the reduction of freight charges by over 50 per cent should contribute much towards a revival of the mining industry of the eastern part of the state (Iron Ore Shipments from Lake Champlain, *Bull. Atlantic Waterways Assoc.*, Vol. 8, No. 6, Philadelphia, 1916). Up to 1906 the mines, worked almost continuously for over a century, had yielded a total output estimated at 35,000,000 long tons, of which amount more than a fifth was mined during the decade 1880 to 1890 (*New York State Museum Bull. 119*, Albany, 1908). The latter date marks the beginning of a period of depression accounted for in part by competition with Lake Superior ores. The Champlain deposits, however, are still productive, and the ore is of high grade, so that under improved conditions of transportation and with demand still active the anticipated revival is justified. To meet it Port Henry at the southern end of the lake is to be equipped with new docks of modern type, capable of handling an annual production of ore estimated at 1,500,000 tons.

SOUTH AMERICA

A New Theory of the Origin of the Chilean Nitrate Deposits. The paralysis of the Chilean nitrate industry during the first months of the war, followed by its no less remarkable recovery, has quickened economic interest in the deposits. Naturally enough comes a recrudescence of scientific interest, with another attempt to solve the vexed question of the origin of the deposits (The Genesis of the Chilean Nitrate Deposits, by J. T. Singewald, Jr., and B. L. Miller, *Economic Geology*, Vol. 11, 1916, No. 2). Unlike former theories the new one seeks to solve the problem of the genesis of the deposits through explanation of their localization. The deposits are limited to the western edge of the *pampa*. The prime causal agencies are the extreme aridity of the region and its peculiar hydrographic features. Although, with the single exception of the Loa, no surface stream reaches the sea between the Rio de Camarones (19° S.) and the Rio de Copiapó (27° S.), the underground water-supply is abundant. The water-table, following the trend of the topography but with less accentuated relief, comes very near the surface of the western edge of the *pampa*. In the *salar* of Lagunas, Tarapacá province, it is only three to three and a half feet from the surface—a circumstance which has proved highly advantageous for the production of pure salt (see "A Unique Salt Industry in Chile," by the same authors, listed in the June *Review*, p. 471). The porosity of the soil of the western *pampa* and the abnormal evaporation, combined with the convergence of ground water in depressions at very slight depths below the surface, cause high concentration of the mineral content of the water. In the most favorable places the degree of concentration becomes such that the more efflorescent salts tend to come out of solution and accumulate in the overlying soil. Where both common salt and nitrate have been deposited the latter naturally tends to effloresce round the edges of the depression: the typical *salar* of common salt is bordered by accumulations of

nitrate. To this simple physical process some or all of those invoked by the earlier theories may have contributed. Atmospheric electricity in the High Andes is a possible agency for the production of nitrate from the air. The decomposition of guano, the nitrogenous source in the theory popularly explained by Tower (The Nitrate Fields of Chile, *Popular Science Monthly*, Vol. 83, 1913), is certainly a factor to a greater or lesser extent. The influence of nitrifying bacteria is rather more problematic. In this connection may be noted a report from the Peruvian School of Mines (Nitrate of Potash in Peru, *Commerce Repts.*, No. 110, Washington, 1916) on an occurrence of nitrate on the Peruvian coast between Pacasmayo and Huarmey. The deposit, of small extent, is of scientific rather than economic interest. The nitrate, existing as the potassium salt, is produced by bacteria and is chiefly remarkable for the rapidity of formation. The deposits have long been exploited by the natives as a source of material for the fire-crackers that are an essential adjunct to the Peruvian *fiesta*.

Professor Bingham's Peruvian Expedition of 1915. In the May issue of the *National Geographic Magazine* Professor Hiram Bingham relates some results of the 1915 Peruvian Expedition, whose successful completion has already been announced (*Bull. Amer. Geogr. Soc.*, Vol. 47, 1915, p. 774). The operations of the expedition were conducted in the same general region as before, i. e. in the basins of the Apurimac and Urubamba Rivers between latitudes 13°30′ (latitude of Cuzco) and 12°30′ S.

Within this territory was covered a considerable area of new ground connected more or less directly with Machu Picchu, a further study of which formed one of the major objectives of the expedition. The former importance of this frontier fortress was confirmed by the discovery of several new trails radiating from the city to various parts of the ancient Inca kingdom. Leaving the Urubamba some distance below Ollantaytambo, the headquarters of the 1915 expedition, a route was taken following the crest line of the Cordillera Vilcapampa and passing some of its most notable peaks—beautiful Salcantay (20,565 feet) of the many glaciers, Soray (19,435 feet), and Soiroccocha (18,197 feet), on whose flanks at an elevation of between 15,000 and 16,000 feet is located what Professor Bingham believes to be the loftiest "forest" (woodland) in the world.

After a descent to the Upper Vilcabamba valley the Cordillera was again traversed by a trail leading direct to Machu Picchu. It is perhaps the most interesting of the lost trails, for it connects the Urubamba fortress with Vitcos on the Vilcabamba, the refuge of the last of the Inca kings. Its course is shown on the route map of the expedition, which also contributes important new information on the hydrography of the region. The earlier expeditions had already proved the existing maps of the region to be seriously incorrect. Raimondi's map, for instance, greatly narrows the divide between the two major rivers and attributes certain tributaries of the Urubamba, notably the Pampaconas, to the Apurimac. A party from the expedition force followed the entire course of the San Miguel, a stream heretofore unmapped and known only to the ubiquitous rubber collector. This stream heads a little north of the Vilcabamba and, flowing in a northwesterly direction, unites with the Pampaconas to form the Cosireni, which in its turn enters the Urubamba at the great bend (see the map accompanying "The Cañon of the Urubamba," by Isaiah Bowman, *Bull. Amer. Geogr. Soc.*, Vol. 44, 1912, No. 12). The party also penetrated a considerable distance up the Comberciato, a still larger tributary entering the Urubamba farther down-stream. Here they encountered members of the hunting and fishing tribe of Machigangas, with whose aid the naturalist secured many valuable specimens.

Machu Picchu itself afforded another fine hunting ground for the natural history collections, for it lies in the transition zone between the temperate and cold highlands and the tropical valleys and plains. Moreover the Urubamba valley forms a migratory route for the bird life of the country, and as many as eighty different ornithological species were noted in this single spot.

The botanical collection was also rich, particularly in food plants. Mr. O. F. Cook, the botanist of the expedition, gives some idea of their value in an article "Staircase Farms of the Ancients" following Professor Bingham's narration. He emphasizes the essentially agricultural foundation of Inca civilization, its antiquity and high development. On biological grounds he believes that most of the cultivated land was originally forested. Its removal must have entailed great labor, and, even when removed, the area at an elevation where agriculture was possible must have been small. Hence not only was the land carefully tilled, fertilized, and irrigated, but its extent was increased by a system of terrace cultivation the most remarkable in the world. The Peruvian plateau and its deep valleys embrace a complete range of climates, and vegetation and food resources are correspondingly varied within short distances. Hence it is not surprising that "more plants appear to have been domesticated in the Peruvian region than in any other part of America." Probably the cultivated plants of the ancient Peruvians num-

ber some seventy or eighty species. For descriptive purposes their distribution is best classified primarily into the three altitudinal belts defined by the use of the predominant food plant: cassava or yuca up to 6,000 feet; maize between 6,000 feet and 11,000 feet; and potatoes from 11,000 feet to the limits of cultivation, over 14,000 feet. The dominant plants of the two latter zones are remarkable for the number of varieties they include, a fact confirming the antiquity of cultivation. Practical interest also attaches to them in respect of the possibilities they present for introduction into the United States. Experiments to this end have been carried out and have proved successful. Last year corn from Cuzco planted on the coast of southern California matured seed where varieties from the corn belt states have failed. The wide altitudinal range of the Andean varieties—Titicaca corn grows at an elevation of nearly 13,000 feet—suggests possibilities of extending the limits of corn cultivation in the United States.

The expedition also continued its anthropological studies. Using the Hrdlička method, 153 Quechua Indians, 90 men and 63 women, were measured and the majority of them photographed. Many other new photographs, some of which illustrate Professor Bingham's and Mr. Cook's articles, add to the importance of the former's unique collection.

New Expedition of Dr. Hamilton Rice to the Northwestern Amazon Basin. Dr. Hamilton Rice, well known for his surveys of the headwater rivers in the Amazon-Orinoco divide region, sailed on November 15 from New York on an expedition to the same area. Doctor Rice proceeded on the *Alberta*, a steam yacht chartered for the occasion, and expects to reach Santa Isabel on the Rio Negro. Using this town as a base he intends to push up the various tributaries as far as possible in a launch which has been especially constructed for this purpose. She is forty feet long and draws only two and one-half feet of water. With a fuel capacity of 700 gallons and a maximum horsepower of 100, she has a cruising radius of more than 1,000 miles, assuming a speed of twelve miles an hour. Doctor Rice's specific field of exploration will probably be the region between the Uaupés and the Inirida Rivers within which only the Içana River has been surveyed, by himself in 1912-13 (see map in *Geogr. Journ.*, August, 1914). Doctor Rice is accompanied on the expedition, which is to last about six months, by Dr. William T. Councilman, professor of pathology at Harvard University; by Ernest Howe, lately of the U. S. Geological Survey, as geologist; and by Earl E. Church of the U. S. Coast and Geodetic Survey, as topographer. The *Alberta* is especially screened against insects and is equipped with a wireless outfit.

Japanese Labor for Brazil. During the last decade Japanese immigration has been favored by the government of Brazil, and several measures have been adopted to deflect such a labor current to the rice fields and coffee plantations of São Paulo and adjacent states. The most recent activity reported is an agreement with a Japanese emigration company for the transport of 20,000 Japanese within a period of two years. The emigrants will be farm laborers and will engage in the cultivation of rice, beans, and coffee. A new steamship line to be inaugurated between the two countries will accommodate the emigrant traffic. Its first sailing is announced for February, 1917 (*Commerce Repts.*, Nos. 264, 265, 1916).

New Steamship Service between Argentina and Bolivia. The November issue of the *Boletín de la Unión Panamericana* reports the initiation of a new line of river steamers putting Rosario, Argentina, into direct communication with the Bolivian port of Puerto Suárez, 1,800 miles distant up the Paraguay. Thus ocean-borne freight destined for Bolivia is transshipped only at Rosario, whereas under former conditions change had to be made at Asunción and frequently at other river ports as well.

EUROPE

Italy and the Adriatic. The Italian point of view of the Adriatic question is set forth under this title by Dr. M. I. Newbigin in the October, 1916, issue of the *Scottish Geographical Magazine* (pp. 466-477). The article, which was originally read before the section of geography at the Newcastle meeting of the British Association in September, 1916, thus presents the opposite side of the case from that taken up by Sir Arthur Evans in "The Adriatic Slavs and the Overland Route to Constantinople" (*Geogr. Journ.*, April, 1916). It is an instructive summary of the essential geographical facts affecting the destiny of the Adriatic region. The easterly seaward extension of the alluvial plains of northern Italy and the increasing shallowness of their ports are seriously hampering Italy's economic development. The lack of deep-water harbors is a check to the free and full exploitation of the resources of the plains. Ravenna and Aquileia have lost their former importance, while Venice is beset by natural drawbacks

which make the navigator shun its approaches. As Doctor Newbigin tersely expresses it, "the hiatus between the railway terminus and the harbor at Venice is symbolic for the whole region."

A marked improvement in this condition is observable as soon as the Austrian sections of the Adriatic area are attained. Here, however, a different set of difficulties has to be faced on account of the mountains which isolate the narrow coastland from its natural rearland. Nevertheless, from Trieste southward along the eastern Adriatic to the Albanian frontier there are found harbors that are deep and commodious. Beyond, the question of Valona is of vital importance to Italian interests. The seaport commands the entrance to the Adriatic. Italy, preparing herself to enter the ranks of industrial nations, is taking stock of her assets. In this, Italian leaders have realized that nature has dealt somewhat stingily with their country. Their endeavor to change its political geography is their bid for betterment.

Has Climate "Changed" within Historic Times in Europe? The subject of possible "climatic" changes within historic times continues to attract the attention of many writers. Dr. H. H. Hildebrandsson, the well-known Swedish meteorologist, has recently read a paper on this question before the Royal Society of Sciences of Upsala (translated in *Monthly Weather Rev.*, 1916, pp. 344-352), which is of rather unusual interest, both because of the prominence of the author and because of the clean-cut conclusions which are reached. The "stock" available evidence is taken up, and under each heading the results of Doctor Hildebrandsson's study are briefly stated. The scope of the inquiry is limited to Europe, and the question is not one of oscillations or periodicities but of permanent change.

The non-instrumental evidence is first considered. In Palestine, the culture of the date and of the vine are practiced today as of old. In Italy the laurel and the myrtle and the vine and the fir grow under the same conditions as in the days of Pliny, of Varro, and of Virgil. Hence the conclusion that the climate of Rome is essentially the same now as at the beginning of the Christian era. J. W. Gregory, Partsch, and others have reached the same result regarding conditions in Cyrenaica and Tunisia. The dates of the vintage and the localities and methods of grape culture in France, as determined by a record of ten centuries, indicate that the climate has not changed appreciably. Grapes were cultivated and wine used to be made at isolated localities in Great Britain, and under special conditions, as might be the case today if such industry were profitable. The dates of the opening and closing of lakes and rivers in Sweden and in Russia have been kept, as a complete series, from early in the eighteenth century and in one case from 1530 (with some breaks). The evidence is that spring comes in the Baltic region at the same time, on the average, as it did early in the sixteenth century. The supposed changes in the climate of Iceland, based on botanical evidence and often referred to, have been shown by Professor Th. Thoroddsen, the leading authority on Iceland, to have been the results of economic and political causes. Fossil trees found in the peat bogs are as small as those growing today, and the most ancient Icelandic saga speaks of people going to Norway for wood to be used in building.

A catalogue of severe winters in Danish waters goes back as a complete series to 1750, and as a broken series to the eleventh century. A study of these dates and of other available facts has led Speerschneider and Norlind to the conclusion that there the climate of the Middle Ages was sensibly the same as that of today. In 1582 to 1597, Tycho Brahe kept his famous non-instrumental meteorological journal on the island of Hven. This journal has been studied by Paul la Cour and by Ekholm and compared with modern instrumental records. Paul la Cour found a difference between the wind directions of 1582-1597 and those of today, and Ekholm concluded that the winters were colder then. Hildebrandsson concludes that the winters were colder during that particular period, but that this result does not justify us in assuming that the winters of that century were *as a rule* colder than the present one. Regarding the Alpine glaciers, the well-known views of Heim are quoted.

Doctor Hildebrandsson's conclusion is clearly stated, as follows: "There exist everywhere climatic variations of long and short duration, but it is not possible to prove that the climate of Europe has changed for either better or worse during historic times." The results of Professor J. W. Gregory's recent study of this same subject led him to a very similar conclusion, viz., "in historic times there has been no world-wide change of climate." R. DEC. WARD.

The Southwesternmost Black Soils of Europe. Writing in the geological series of the *Trabajos del Museo Nacional de Ciencias Naturales* of Madrid (No. 13, 1915), E. Hernández-Pacheco discusses the age and origin of the "black lands" of southernmost Spain. They lie between Cadiz and Gibraltar, in the Janda depression, a tectonic

feature due to a twin system of fractures running at right angles to each other. This bowl-shaped depression has a flat bottom lying at about sea-level and practically lacking an outlet. The shallow lagoon formed in the site during each winter season dwindles away in the summer months, leaving a black residue presenting great resemblance to the well-known *chernoziom* of southern Russia or the *tirz* of western Morocco (see also "Las Tierras Negras de Marruecos," by Juan Dantin, in the same publication).

As far as known, these black soils, whether in Spain or Morocco, were formed under climatic conditions which are no longer prevailing. The black color is attributed to a carbonaceous humus generated during the decomposition of profuse vegetation growing under conditions of excessive humidity. The climate of the period of formation varied probably from temperate to cold, a characteristic of the Quaternary glacial epochs in certain regions of southern Europe. These deposits may be correlated chronologically with the loess of northern Europe and of Asia.

The uppermost layers of this black soil contain abundant relics of the Stone Age industries in the shape of quartzite and flint instruments, some of which undoubtedly belong to the Musterian, while others are probably of the Chellean type. These cultural deposits surround the plain of Janda and give evidence of the upper age limit of the black earth deposits.

The Export of Newfoundland Herrings to France. A relaxation of the "Bait Act" is enabling the export of several thousands of barrels of herrings from Newfoundland to France, where a serious shortage has been experienced in consequence of the war. This step on the part of the Newfoundland government expresses a relation new in the history of the Grand Banks fisheries, notorious for the clashing of French and British interests. The Bait Act was itself an outcome of the opposed interests. It was passed in 1886 to prohibit the sale of bait to the fishers of St. Pierre, who, aided by the high bounty awarded by the French government, could everywhere undersell the Newfoundland cod on the European markets (Round the Empire Notes, *United Empire*, N. S., Vol. 7, 1916, No. 8).

ASIA

Rainfall of China. Mr. Co-Ching Chu, a student in the Graduate School of Harvard University, has constructed a new rainfall map of China, based on data for 44 stations for the period 1900-1911 (*Monthly Weather Rev.*, 1916, pp. 276-281). Where the records do not cover this interval they have been reduced to it by comparison with neighboring stations. Three rainfall districts are noted. First, North China, with mean annual amounts of 20-40 inches (50-100 cms.). More than 60 per cent of the rain falls in the three summer months, with a maximum in July or August and a minimum in February. Second, the Yangtze Valley, with mean annual rainfalls between 40 and 60 inches (100-150 cms.), decreasing very gradually from the coast inland. Winter rains are more abundant than in northern or in southern China, although the amounts are small. July brings the maximum at most stations, and December the minimum. Third, South China, with mean annuals between 60 and 80 inches (150-200 cms.) along the coast, and 40 to 60 inches (100-150 cms.) inland. The percentages of rainfall in summer increase again in this district. June, or sometimes August, brings the maximum monthly rainfall. The control of the rainfall by various types of storms and by wind directions is considered. In northern China the precipitation of winter (December to February) is all in the form of snow; in central China it is partly rain. Snow is rare at Canton and Hongkong. R. DEC. WARD.

Railroads in Siam. Progress in the construction of Siamese railroads foreshadows the establishment of a rapid land route between the Gulf of Bengal and the China Sea. As soon as the Siamese railroads become linked with the systems in China and Indo-China an overland short-cut will become available and the long voyage around Singapore may be avoided.

The first railroad in Siam was opened in 1897 and ran between Bangkok and Ayuthia, the old capital (*Suppl. to Commerce Repts. No. 58a*, Nov. 6, 1916). This, the northern part of the system, has steadily been extended up the valley of the Menam River and beyond, where it now reaches Lampang, on the upper Meping, a western tributary of the Menam. The short distance to Chiengmai, the northern capital, will be completed before long. The region to be tapped here is rich in natural resources. With adequate transportation its products will find a ready market in Bangkok. The southern part of the system embraces the coastal districts of the Gulf of Siam. Of a total of 470 miles, 120 miles were in operation on April 1, 1915. Its most important section will eventually run along the whole length of the Malay Peninsula.

Two Siberian Expeditions. The Sayan expedition, which returned in the early part of the year, has made a study of economic conditions in the fur-producing region of the upper Yenisei (*Russian Suppl. of the London Times*, April 29, 1916). The expedition was organized by the Department of Agriculture and conducted by the game specialist and Asiatic explorer D. K. Soloviev. It represents another measure on the part of the Russian government for the protection of an industry seriously threatened with extinction. In particular, apprehension has been felt for the sable trade, reduced of late to one-sixth of its former dimensions. In 1912 a prohibition of the hunt was extended to Siberia for a term originally planned for three years, but the expedition considers necessary a renewal of the law for an equal length of time. The active measures of the expedition embrace the creation of two warrens, the Sayan of about 630,000 desiatims (1,700,000 acres) and the Kazyr-Suk of about 120,000 desiatims (324,000 acres).

Successful results were also obtained by the Yablonovyi expedition despatched by the Academy of Science in the summer of 1914 under the leadership of V. Ch. Dorogostaiski. Explorations were carried out in the central portion of the Yablonovyi Range, a region occupied by Yakuts and Orochones, the latter a Tungusic tribe described by M. A. Czaplicka in her "Aboriginal Siberia." The expedition achieved its main objective in the collection of valuable specimens of the alpine fauna, including the local mountain sheep heretofore unknown in the European museums (*Russian Suppl. of the London Times*, same date).

POLAR REGIONS

Survey of the Newly Discovered Land by Stefansson. The latest advices received from Stefansson direct, a letter published in the *New York Times* of November 15, report that the survey has been begun of the new land discovered in June, 1915, north of Prince Patrick Island, the northwesternmost of the hitherto known islands of the American Arctic Archipelago (*Bull. Amer. Geogr. Soc.*, Oct., 1915, pp. 766-769, with map). The letter was sent from 78° N. and 116° W., a position corresponding to the southern edge of the new land; it is undated, but from internal evidence it seems to have been written about May, 1916. From hills a thousand feet high inland from Cape Murray (evidently the name given to a cape on the southern coast of the new land), Stefansson says that a water sky could be seen trending first north-northeast for 10 miles and then northwest for 30 miles. The presumption is that the coast has a similar trend, although the actual line could not be distinguished because it was low and covered by snow. On the day of writing a support party consisting of Storkersen, Thomsen, Kilian, and Illum was to return. An advance party consisting of Castle, Noice, and Andersen had left Cape Murray the day before, following the coast north. Stefansson himself was to follow in two days with two Eskimos. This in spite of the fact that he had sprained an ankle so badly about a week before that he did not expect to be able to walk for some weeks. At the time of writing he reported that he was riding with his foot strapped to a board and leaving the sled only occasionally to take compass bearings. Although annoying, he did not consider the accident serious. The men and dogs were living mainly on game, which was abundant. In case this source of supply should diminish, he reports having on hand about a thousand pounds of food and two hundred pounds of kerosene.

Stefansson expected to return by July 20 to the northern end of Melville Island, unless the new land proved extensive, in which case he planned to spend the summer there. The *Polar Bear*, which had been wintering in Prince of Wales Strait, between Banks and Victoria Islands, as already reported on his return by Doctor Anderson, the leader of the southern division of the expedition (September *Review*, p. 233), had orders to meet Stefansson and the new-land party at Melville Island in August, to winter there. Storkersen, with three Eskimos' families, was to spend the summer drying meat and skins in Melville Island for food and clothing for the next spring's trips, in case the *Polar Bear* should not reach Melville Island or should be wrecked.

Several other letters recently received from Stefansson give details with regard to the activities of the expedition since August, 1915, the latest date dealt with in the last communication previously received from Stefansson himself. In September, according to a letter dated Banks Island, January 15, 1916 (*New York Times*, Nov. 15), a party was sent out to survey as much as possible of the gap left in the northeastern coast of Victoria Island between Wynniatt's survey of 1851 and Hansen's of 1905. The supporting party returned safely to the *Polar Bear* on November 2, having left Storkersen, who was in charge of the survey, in good health at Hornby Point, almost as far as Wynniatt's farthest, on October 24. Storkersen expected to advance ten days farther

and consequently had not returned on November 16, when Stefansson left for the Cape Kellett base on the southwestern corner of Banks Island.

Another detail is contained in a letter written at Cape Kellett on December 23, 1915, to Dr. H. J. Spinden of the American Museum of Natural History (*New York World*, Nov. 21). It says that an unfortunate falling out occurred with the "blond" Eskimos of Stefansson's previous expedition. The captain of the *Polar Bear*, whom Stefansson had sent to Minto Inlet, where they were, treated them as inferior beings. This they resented. Complications ensued which resulted in their stripping the captain's party of all they had, down to their drinking cups and plates. To make matters worse, the Eskimos contracted influenza and, when last heard from, were on the verge of starvation because illness had prevented hunting. Their troubles they ascribed to the white man's witchcraft. Should death among them occur either from disease or starvation, Stefansson writes, the break will be serious. At the time they professed great friendliness for Stefansson personally, but, even so, the changed circumstances made inadvisable a sojourn with them which Stefansson had planned.

At present the prospects are that Stefansson will not return until the fall of 1917. In a long letter to Rear Admiral Peary, dated Cape Kellett, January 11, 1916 (*New York Times*, Nov. 23), in which he outlined his plans, he says he still adheres to the original purpose of the expedition, the search for land north and west of the known extent of the Arctic Archipelago. He now places himself the limits of 83° N. and 45° W. Only in case no news of him is received by the spring of 1918 should a relief expedition be sent. But in general he urges that no anxiety be felt for him and pleads that more confidence be placed in his ability to take care of himself than was done during his previous silence.

In this connection it is worth noting that a correct map of Stefansson's routes in 1914-15 has appeared with the official account of the expedition (*Report of the Dept. of the Naval Service for the Fiscal Year Ending March 31, 1916*, pp. 71-80, Ottawa, 1916). It does not differ materially from the map published in the *Bulletin of the American Geographical Society* for October, 1915 (p. 767), which was based on the newspaper account of the trip.

Present Condition of the Crocker Land Expedition. The Acting Chairman of the Committee in Charge has sent to the Society the following latest information concerning the Crocker Land Expedition. According to a cablegram received from Copenhagen on November 15, 1916, the steamer *Danmark*, which was chartered by the committee for the relief of Doctor Hovey and the members of the expedition in north Greenland, was observed in Melville Bay on August 20, 1916, bound northward. From this report it would appear that the steamer had made only 150 miles northward in seventeen days, since previous advices reported her as being off Upernivik on August 3, 1916. This report and her failure to arrive either at Sydney or St. John's indicate that the ice conditions are severe and that the vessel has probably been delayed by ice on her southward voyage. It is still possible that the *Danmark* may reach this country before the end of the year, but even should she be caught in the ice and be compelled to winter in the north no anxiety need be felt for the safety of the party, as the vessel is staunch, well equipped, and well provisioned.

The first relief ship, the *George B. Cluett*, left its winter quarters in North Star Bay the latter part of July and arrived at Battle Harbor, Labrador, on September 7, 1916. She brought out a letter from Doctor Hovey, dated July 10, 1916, stating that he was in touch with Mr. Rasmussen, that the members of the Crocker Land Expedition were well, that Mr. MacMillan had returned to Etah on May 6, 1916, from his 1,500-mile sledge journey to the westward, and that all were looking forward to the arrival of the second relief ship, the *Danmark*.

OCEANS

The Drift of Mines at Sea. A year after the siege of Port Arthur a Japanese steamer nearing Honolulu struck a mine which had traveled more than half the distance across the Pacific. This is one of several cases going to prove that dangers to navigation from derelict mines are by no means impossible. In a paper contributed to *La Nature* for May 27, 1916, Professor Alphonse Berget calls attention to future perils from this source. Basing his argument on a study of currents, the eminent oceanographer finds that vessels will run greater risks in the waters of the neutrals of the present war than in those of the belligerents.

The displacement of floating mines from the area in which they have been strewn is caused by currents. A study of conditions in the Atlantic Ocean shows that floating mines will be liable to drift in a northeasterly direction and that they will eventually attain the coasts of Holland, Germany, Denmark, and Norway. Should any of these

floating weapons be caught by the "Irminger Current"—a northeasterly offshoot of the Gulf Stream which sweeps counterclockwise past Iceland and swings around the southern end of Greenland, finally to merge with the Labrador Current—they might reach the east coast of North America.

In the Gulf of Gascony, an easterly branch of the Gulf Stream sweeps southward along the coasts of La Vendée and the *département* of Landes, after which it continues its course along western Spain. According to investigations undertaken in 1901 under the direction of Prince Albert of Monaco, it was found that floating objects deposited in the Gulf of Gascony eventually reached the northwestern shores of Spain and the northern reaches of the Portuguese coast.

In the Baltic the danger will be greatest along the Swedish coast. The twin system of currents peculiar to this sea consists of a stream proceeding from the North Sea along the Jutland coast into the Skagerak. A counter current along the Norwegian coast empties its waters into the North Sea. In the inner stretches of the Baltic the easterly flow of water is represented by a current along the German coast and northward. A southerly stream washes the Swedish shore.

In the Mediterranean the development of currents is comparatively feeble. The most significant in this connection is that which, traversing the mine-strewn Dardanelles, carries the superficial waters of the Black Sea to the Austrian side of the Adriatic.

WORLD AS A WHOLE AND LARGER PARTS

Proposed New Railroads in the Russian Empire. The remarkable progress of Russian railroad building since the outbreak of the war is an indication of the country's awakening to its industrial needs. Under the title of "Russia's War-Time Outlets to the Sea," an account of the first great stride made to promote Russian transportation facilities was given in the February number of the *Review*. Later advices show that the Russians' eagerness to equip their country with a convenient network of tracks has not abated.

One of the projected railroads is the White Sea-Ural-Ob River line. From Archangel, proceeding east-southeast by way of Pinega, the middle reaches of the Mezen River, and the Ukhtinsky district on the upper Ishma (63° N. and 54° W.), the line will cross the Pechora River at Troitzko-Pechorsk, continue across the Urals, and reach the Ob River at its westernmost bend near the Chemashevsky settlement (63° N.). A southward branch will be built along the eastern foot of the Urals to the station Nadezhdinsky Zavód of the Bogoslovsky railway, a northward branch of the trunk line from Petrograd to Siberia, which it joins at Yekaterinburg. The new line, whose total length will be about 1,000 miles, will thus become continuous with the main Russian system. It will open up districts rich in natural resources: the dense forests of the Mezen, Pechora, and Ob basins and the iron ore and mineral fuel of the eastern slope of the Urals. Besides, Siberian exports, chiefly grain, will be provided with a new outlet.

Other schemes to provide Siberia with new railways are noted in the July, 1916, issue of the *Scottish Geographical Magazine*, which reproduces in abstract form an article and its accompanying map from the *London Times Russian Supplement* for May 27, 1916. New lines are proposed to connect the Lena gold district and the Vitimsk mining area with the Trans-Siberian railway. Out of various proposals, the construction of a line between Tulun, a small station 170 miles west of Irkutsk, and Ust-Kut on the Lena has been selected, and it is expected that the completed line will be prolonged to Bodaïbo, northeast of Lake Baikal, although the method of reaching this terminal directly from Irkutsk by way of Kunerma also finds favor. Minerals and timber abound in this region. Another scheme is in consideration to connect the Kuznetsk coalfields, on the upper Tom south of Tomsk, with the main line at Sudjenka. From this coal basin the line might be extended westward with advantage to Barnaul, in the center of a rich agricultural and cattle-raising district.

In the Far East, Manchuria is to be provided with about 650 miles of new railways (*Far Eastern Review*, April, 1916). An agreement was signed on March 27, 1916, between Russia and China for the construction of a railway to connect the Chinese section of the Trans-Siberian railway (known as the Chinese Eastern Railway) at Tsitsikar with the Amur at Aigun. The line will be continued a short distance upstream in order to end opposite Blagovyeshchensk, the present terminus of the Amur Railway, to which reference was made in the June *Review* (under "Siberian Traffic Problems," p. 461). From Mergen, halfway between Tsitsikar and Aigun, a branch will be run to Kharbin. These new lines will widen the range of the colonization set afoot by the construction of the Chinese Eastern Railway. Chinese settlers followed quickly in the wake of this line, and it is expected that the same migration will be continued. The better agricultural

lands lie southeast of Mergen, near the Sungari River and its affluents, the Hulan and Tunkan. Northward, agriculture yields in importance to forestry and mining.

All these activities are not confined to Russia's ante-bellum domain, as may be gathered from a recent decision of the government to extend the Caucasus railroads from Batum to Trebizond. The *Board of Trade Journal* for October 12, 1916, states that the connecting line will be of the ordinary Russian broad-gage type and that it will be constructed close to the Black Sea coast, so as to avoid the ranges forming the background of this body of water. It is expected that this line will be completed by the summer of 1917.

Rainfall Correlation between North and South America. Mr. H. H. Clayton, of the Argentine Meteorological Office, has made a comparison between the rainfall of the United States (long. 80° W.-110° W.), the annual stages of the Paraná River, and the rainfall of Australia (inverted). The correlation appears to be very close and is probably associated with correlations of temperature found by Mossman and Arctowski in the southern hemisphere. The temperature curves of Alice Springs, Australia, and Córdoba, Argentina, are closely similar to the rainfall and Paraná River curves, and the Arequipa, Peru, temperature curve also furnishes some interesting analogies (*Monthly Weather Rev.*, 1916, pp. 200-201). R. DEC. WARD.

PHYSICAL GEOGRAPHY

A New Experiment on the Strength of the Earth's Crust. The construction of a great irrigation reservoir by the government of New South Wales is affording the geophysicist an unusual opportunity for experiment (Some Geophysical Observations at Burrinjuck, by L. A. Cotton, *Journ. and Proc. Royal Soc. of New South Wales*, Vol. 49, Pt. 3, 1915). The reservoir in question, at Burrinjuck on the Murrumbidgee, is to have a height of 236 feet and a water storage capacity of 30,000,000,000 cubic feet. The weight of such a mass of water must exert a strain upon the contiguous crust. It is this effect that is being investigated. Three pendulums, two of them the instruments used by Hecker and Schweydar in their famous experiments on earth-tides, have been installed in shafts in the steep hillsides enclosing the reservoir. At the time of publication they had been recording satisfactorily for the greater part of a year. In addition to earth-tide, earthquake, and fault movements, they have recorded movements of specific interest to the investigators—slow deflections from the vertical apparently related to the action of the water load. The cause of these movements cannot yet be stated. Local isostatic adjustment and resiliency of the crust have been suggested, but a conclusive opinion must rest on further quantitative evidence.

"Sleet." The Weather Bureau has recently carried on a considerable correspondence in an endeavor to ascertain what meanings are associated with the term *sleet*, with a view to the adoption of a suitable "official" definition. The result of this investigation is that the definition adopted in 1897 is adhered to, viz., "Only the precipitation that occurs in the form of frozen or partly frozen rain shall be called sleet." For the icy coating which is formed by the freezing of rain on cold objects near the earth's surface, the term "ice storm" is rejected and the term *glaze* is adopted. This is the equivalent of the English "glazed frost," the French "verglas," and the German "Glatteis" (*Monthly Weather Rev.*, 1916, pp. 281-286). R. DEC. WARD.

GEOGRAPHICAL NEWS

Captain Amundsen's Visit to This Country. Captain Roald Amundsen arrived in New York on November 27 on the *Frederik VIII* from Copenhagen. One of the purposes of his trip is to purchase an aeroplane for his projected North Polar trip. Details as to this expedition and its postponement were published at the time (*Bull. Amer. Geogr. Soc.*, Vol. 45, 1913, p. 618, and Vol. 46, 1914, pp. 532-533). The voyage is to be essentially a repetition of Nansen's drift in the *Fram*, amplified, however, by our increased knowledge of Arctic meteorology and oceanography. The recent newspaper accounts (e. g. *New York Times*, November 28) quote Amundsen as planning to begin his drift from the easternmost attainable point off the coast of Siberia. His original plan was to start from Bering Strait in order that the drift might carry him nearer to the pole than it did Nansen (Die Probleme des Nordpolarbeckens: Aufgaben und Plan einer neuen "Fram"-Expedition, *Internatl. Rev. der gesamten Hydrobiol. und Hydrogr.*, Vol. 1, 1908, pp. 753-771). The point of emergence from the Polar Basin is expected

to be between Greenland and Spitzbergen. Amundsen now hopes to be able to leave Norway in July, 1918. The aeroplane would be used for side excursions from the ship, including one to the pole.

Personal

Dr. J. G. Andersson, formerly chief of the Geological Survey of Sweden, has been appointed by the Chinese government as the head of a geological survey.

Dr. J. Ernest Carman of the University of Cincinnati has been appointed to the chair of geology at the Ohio State University vacant by the death of Professor Charles S. Prosser.

Professor Frederick Ehrenfeld of the University of Pennsylvania conducted a conference on "Factors in the Lowering of the Land Surface" at the Brooklyn Institute of Arts and Sciences on November 18.

Professor E. de Martonne, Visiting French Professor at Columbia University, read a paper on "The Limestone Plateaus of the Causses, Southern France" before the New York Academy of Sciences on November 20.

Sir Ernest Shackleton arrived in New Orleans on November 3 from Colon and departed immediately for San Francisco on his way to rescue the ten members of his expedition marooned on the Ross Sea side of the Antarctic continent. On November 8 he sailed from San Francisco for Wellington, New Zealand, where he and the rescue expedition expected to sail for the Antarctic on the *Aurora*.

Obituary

Professor Maurycy Rudzki, since 1902 director of the Cracow Observatory, has died at the age of 54 years. Professor Rudzki is best known to geographers for his "Physik der Erde," Leipzig, 1911.

GEOGRAPHICAL PUBLICATIONS

(Reviews and Titles of Books, Papers, and Maps)

For key to classification see "Explanatory Note" in the July number, pp. 77-81

NORTH AMERICA

UNITED STATES

South-Central States

FOSTER, J. H. **Forest conditions in Louisiana.** 39 pp.; maps, ills. *Forest Service Bull. 114.* U. S. Dept. of Agric., Washington, 1912.

The geographical divisions of Louisiana are better understood than those of some other states, owing largely to the researches of Dr. E. W. Hilgard in 1869 and 1877 (see his map in Tenth Census reports, Vol. 5, opposite page 111). In the bulletin before us the state is divided into six or seven divisions, corresponding in a general way with Hilgard's, namely: short-leaf pine uplands, long-leaf pine region (including both hills

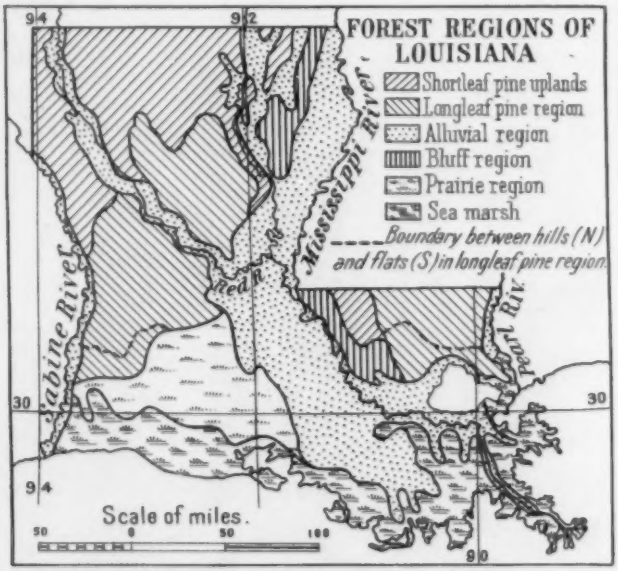

FIG. 1—The forest regions of Louisiana, according to J. H. Foster (*U. S. Forest Service Bull. 114*, 1912.)

and flats), alluvial region, bluff region, prairie region, and sea marshes. The forest conditions are briefly described, about two and a half pages being devoted to each of the timbered regions and a few lines to the last two, which are essentially treeless. Statistics are given of land and timber values, density of forests, amount of timber remaining, etc. There are four excellent half-tones showing different forest types and three small state maps in the text.

From the standpoint of the forester the long-leaf pine and alluvial regions are most important, the former yielding pine timber and naval stores and the latter cypress and hardwoods. Some of the densest long-leaf pine forests in the world are in western Louisiana, and a stand of 45,000 feet per acre of cypress is reported from one of the northeastern parishes.

Only about 20 per cent of the total area is under cultivation at present, and in recent years Louisiana has led all the states in annual cut of long-leaf pine, cypress, and tupelo gum, and all except Washington in aggregate lumber. In 1909, the latest year for which there are reasonably complete figures, the total cut was over 3,500,000,000 feet, of which slightly over three-fourths was pine. Some estimates of the total standing timber in the state were taken, a few months in advance of publication, from a report of the U. S. Bureau of Corporations on the lumber industry of the United States. The total stand is given as 119,800,000,000 feet, of which 56.5 per cent is pine of various species, 13.1 per cent cypress, and 30.4 per cent hardwoods.

The bulletin closes with a discussion of some of the influences that threaten the perpetuity of the forests, such as fire, grazing, lumbering, wind-storms, and taxation, and a summary of recent local legislation on forest problems. As in most other similar works written by northern foresters, fire is treated not so much as a natural phenomenon, whose frequency varies considerably in different regions and has much to do with the normal life-history of the forests, but as a regrettable accident, to be prevented in all forests if possible. It is conceded, however, that it is not a serious menace in the alluvial region. ROLAND M. HARPER.

BAKER, C. L. **Geology and underground waters of the northern Llano Estacado.** v and 225 pp.; maps, diagrs., ills., index. *Bull. Univ. of Texas*, 1915, No. 57. Austin, 1915. [A publication of the Bur. of Econ. Geol. and Technol.]

BURKE, R. T. A., AND A. M. O'NEAL, JR. **Soil survey of Limestone County, Alabama.** 41 pp.; maps. Bur. of Soils, U. S. Dept. of Agric., Washington, D. C., 1916.

CRIDER, A. F. **The coals of Letcher County [Kentucky].** xvi and 234 pp.; maps, diagrs. *Kentucky Geol. Surv.* [*Repts.*], Ser. 4, Vol. 4, Part 1. Frankfort, 1916.

DUMBLE, E. T. **Problem of the Texas Tertiary sands.** Maps, ills., bibliogr. *Bull. of the Geol. Soc. of America*, Vol. 26, 1915, No. 4, pp. 447-476.

HUMPHREYS, W. J. **The southern Appalachian earthquake of February 21, 1916.** Map. *Monthly Weather Rev.*, Vol. 44, 1916, No. 3, pp. 154-155.

LEE, WALLACE. **Geology of the Kentucky part of the Shawneetown quadrangle.** 73 pp.; map. Kentucky Geol. Surv., Frankfort, 1916. [Including report on deposits of coal, the only mineral of economic importance within the area.]

LEWIS, H. G., AND J. F. STROUD. **Soil survey of Lawrence County, Alabama.** 50 pp.; maps. Bur. of Soils, U. S. Dept. of Agric., Washington, D. C., 1916.

MARKHAM, E. M. **Father of waters [Mississippi River] in flood.** *Engineering News*, Vol. 75, 1916, No. 6, pp. 286-287.

MEYER, A. H., E. S. VANATTA, B. W. TILLMAN, AND R. F. ROGERS. **Soil survey of Webster Parish, Louisiana.** 40 pp.; maps. Bur. of Soils, U. S. Dept. of Agric., Washington, D. C., 1916.

Western States

BOWLBY, H. L. **The Columbia highway in Oregon.** *Amer. Forestry*, No. 271, Vol. 22, 1916, pp. 411-416. [A well-illustrated description of the new highway from Portland to Hood River, 60 miles, which extends across marshlands, valleys, and mountains, through dense forests, and along the brink of a canyon, to the open country east of the Cascades. The route was chosen so as to give splendid views of the scenic features of Oregon.]

—— **Columbia Highway, The new.** Diagr., ills. *World's Work*, Vol. 32, 1916, No. 2, pp. 202-215. [A short description also appears in the *Scientific American* (Vol. 114, No. 25, 1916) under the title "A Beautiful Link in Our Highway System."

—— **Columbia River highway, The.** Ills. *Scientific American Suppl.*, No. 2113, Vol. 82, 1916, July 1, p. 8.

DAVIS, A. P. **Power possibilities of Federal irrigation projects.** *Engineering News*, Vol. 75, 1916, No. 19, p. 875.

DICE, L. R. **Distribution of the land vertebrates of southeastern Washington.** Map, ills., bibliogr. *Univ. of California Publs. in Zoöl.*, Vol. 16, 1916, No. 17, pp. 293-341. [This area of southeastern Washington (Walla Walla and Columbia Counties) embraces three phytogeographic regions in the sage brush of the Columbia River section, the bunch grass of the prairie to the east, and the coniferous forest of the Blue Mountains. Faunal areas correspond. Description of their characteristics is followed by a consideration of the general zoögeographic position of the entire region and the author's scheme of ecological distribution compared with others.]

DILLER, J. S. **The volcanic history of Lassen Peak.** Maps. *Science*, May 26, 1916, pp. 727-733.

DREW, N. L. **Building the world's highest highway.** Ills. *Scientific American*, Vol. 114, 1916, April 8, No. 15, p. 375. [Pikes Peak.]

FLETT, J. B. **Features of the flora of Mount Rainier National Park.** 50 pp.; ills., index. Dept. of the Interior, Washington, D. C., 1916. [See comment in the November *Review*, p. 386, on G. F. Allen's "The Forests of Mount Rainier National Park."]

GROVER, N. C. **Surface water supply of the United States, 1913. Part 9: Colorado River basin.** 260 pp.; ills., index. *U. S. Geol. Surv. Water-Supply Paper 359.* Washington, 1916.

GROVER, N. C. **Surface water supply of the United States, 1912. Part 12: North Pacific drainage basins.** xi and 748 pp.; ills., index. *U. S. Geol. Surv. Water-Supply Paper 332.* Washington, 1916.

HACKETT, C. W. **Otermin's attempt to reconquer New Mexico, 1681-1682.** Bibliogr. *Old Santa Fe*, Vol. 3, 1916, No. 9, pp. 44-84; No. 10, pp. 103-132. Santa Fe, N. M.

HARDESTY, W. P. **Precise-level survey of the city of Portland, Oregon.** Diagrs., ills. *Engineering News*, Vol. 76, 1916, No. 2, pp. 55-58.

HARRIS, J. A. **The variable desert.** Diagr., ills. *Scientific Monthly*, Vol. 3, 1916, No. 1, pp. 41-50. ["The striking characteristic of this whole region [the deserts of the Southwest] is heterogeneity, variability, contrast."]

HENRY, A. J. **The disappearance of snow in the high Sierra Nevada of California.** *Monthly Weather Rev.*, Vol. 44, 1916, No. 3, pp. 150-153.

HILL, C. L. **Forests of Yosemite, Sequoia, and General Grant National Parks.** 39 pp.; ills. Dept. of the Interior, Washington, 1916. [See comment in the November *Review*, p. 386, on G. F. Allen's "The Forests of Mount Rainier National Park."]

HOLWAY, R. S. **Lassen's second year of rejuvenation.** Ills. *Sierra Club Bull.*, Vol. 10, 1916, No. 1, pp. 92-97. [Carries the record of eruption to October 30, 1915.]

HUNTINGTON, ELLSWORTH. **Death Valley and our future climate.** Ills. *Harper's Mag.*, No. 792, Vol. 132, 1916, May, pp. 919-928. [The strange series of old lake beds in the desert region from Owens to Death Valley preserves records of climatic changes during the past and demands more careful study that impending changes may be predicted. Such a change, for instance, as appears to have occurred in the later thirteenth century would be followed by serious consequences for the country as a whole in view of the economic effects it would produce in the region of "critical" rainfall of the agricultural Middle West.]

EUROPE

GENERAL

GRANT, MADISON. **The Passing of The Great Race, or the racial basis of European history.** xxi and 245 pp.; maps, index, bibliogr. Charles Scribner's Sons, New York, 1916. 9½ x 6.

A geographer of the eighteenth century, Alexander Dalrymple, once remarked "every new undertaking must be dragged up a very steep hill." Mr. Grant's book deals with an old theme in a radically new way but with a literary brilliance and finish that never permits one to realize until the book is closed that the course runs up a very steep hill. Of more importance, he has had the courage to state his conclusions in terms of unmistakable force and clarity. To be sure these desirable qualities are achieved at the expense of much detail that the meticulous reader will miss. Everywhere the direct road is taken to a conclusion that is stated with epigrammatic brevity. It is a book from which the historical and the anthropological writer will quote freely.

The central theme is the Nordic race—its origin, its distribution in late geologic and in historic times, its inherent and stable, in a word, its racial qualities, particularly those which have made it great (Mr. Grant would say "greatest"). These qualities are in part reactions to a former environment, in part the result of contact with neighboring races, in part a spiritual endowment of the race as obscure in its origin as man himself. The author's purpose has been to set forth the facts of race, the reactions of race, race and development, and especially to show both directly and by implication that, in the great panorama of human history, environment on the one hand and language and nationality on the other are agencies with an important but limited field of action.

Those geographers to whom the phrase "geographic control" is a dogma will do

well to read with special care the chapter on Race and Habitat; those to whom the metes and bounds of nationality and language are sacred, the chapter on Race, Language, and Nationality. Geographers will find here and there an approach to the question of environmental influences, but to their regret they will not encounter a discussion of this broad question, though this indeed would require a book to itself. On the other hand the influence of environment is not minimized. It is shown that its effects on primal habits are best illustrated when the race leaves its ancient centers of action and overspreads neighboring lands that present new problems in adjustment, as in the case of the successive human floods that poured over the Afghan passes, or those waves of conquest in which the Nordics left their isolating forests and seas and set their vigor against the feebler qualities of the peoples of the south only in turn to fall a prey to the enervating climate of Mediterranean lands.

In geographic science the book is important because it will stimulate anew the question of the relative parts which heredity and environment play in human development. For the whole interpretation of the world's peoples surely requires attention both to the primal and inheritable qualities of race and to the impact of physical conditions upon the frame and spirit of man, his migrations, and his character. Geographers pay much attention to the latter group of influences but too little to racial traits. It would be a worthy task to have both groups set forth in their relative importance, working from such foundations as this book and others in the same field provide.

GERMANY

BENKENDORFF, RUDOLF. **Die Isothermen Schleswig-Holsteins und klimatische Messungen auf Föhr.** Inaugural-Dissertation . . . der Universität Kiel. Schmidt & Klaunig, Kiel, 1914. 9 x 6.

The island of Föhr lies off the coast of Schleswig-Holstein. Because of its sheltered location and mild climate it is much frequented by invalids. There is, therefore, considerable interest in its somewhat special local climatic peculiarities. These have been made the subject of investigation by the present author, who, for purposes of comparison, has also studied the temperature conditions of Schleswig-Holstein and has constructed a new set of monthly isothermal charts of this area. In 1869 Professor G. Karsten published a discussion entitled "Die Verteilung der Wärme in den Herzogtümern Schleswig und Holstein," in which were included two isothermal charts, for January and July. In winter and autumn the temperatures are lower over the land than the water; in April to July the temperature increases from west to east, i.e., to leeward, from the water onto the land. The temperature differences are greatest in October, November, December, and June (about 2° C.). February and August show the most uniform distribution. The diurnal ranges of temperature are considerably smaller (averaging 1.5° C. in the mean) on the island of Föhr than over the mainland. Photometric measurements of the relative influence of water and land surfaces upon the intensity of the light, and measurements of the value of the light reflected from different kinds of soil, are included in the report. In view of the hygienic importance which is now known to attach to the character and amount of sunlight and of sky-light, such observations have considerable local interest.

R. DEC. WARD.

ALBERT, T. J. **Brunswick.** *Suppl. to Commerce Repts.*, Ann. Series, 1916, No. 6b, pp. 7-9. Bur. of Foreign and Domestic Commerce, Dept. of Commerce, Washington, D. C.

—— **Bodenbenutzung, Die, und der landwirtschaftliche Anbau, 1913.** *Beiträge zur Statistik des Grossherzogtums Hessen*, Vol. 63, 1913, No. 5, pp. 1-68. Grossh. Hessische Zentralstelle für die Landesstatistik, Darmstadt, 1914.

EAGER, G. E. **Barmen.** *Suppl. to Commerce Repts.*, Ann. Series, 1916, No. 6c, pp. 1-2. Bur. of Foreign and Domestic Commerce, Dept. of Commerce, Washington, D. C.

—— **Ernte in Preussen 1913, Die.** *Zeitschr. des Kgl. Preussischen Statistischen Landesamts*, Vol. 54, 1914, pp. xvii-xix.

FEE, W. T. **Bremen.** *Suppl. to Commerce Repts.*, Ann. Series, 1916, No. 6c, pp. 2-4. Bur. of Foreign and Domestic Commerce, Dept. of Commerce, Washington, D. C.

GALE, W. H. **Munich.** *Suppl. to Commerce Repts.*, Ann. Series, 1916, No. 6c, pp. 13-16. Bur. of Foreign and Domestic Commerce, Dept. of Commerce, Washington, D. C.

HAMMER, ERNST. **Die neuen Normalhöhenpunkte für Preussen.** *Petermanns Mitt.*, Vol. 62, 1916, Jan., p. 21.

HARRIS, H. W. **Frankfort on the Main.** *Suppl. to Commerce Repts.*, Ann. Series, 1916, No. 6b, pp. 1-7. Bur. of Foreign and Domestic Commerce, Dept. of Commerce, Washington, D. C.

JEWETT, M. A. **Kehl.** *Suppl. to Commerce Repts.*, Ann. Series, 1916, No. 6b, pp. 10-15. Bur of Foreign and Domestic Commerce, Dept. of Commerce, Washington, D. C.

KEMPER, G. H. **Erfurt.** *Suppl. to Commerce Repts.*, Ann. Series, 1916, No. 6c, pp. 11-13. Bur. of Foreign and Domestic Commerce, Dept. of Commerce, Washington, D. C.

KLUTE, F. **Büsserschneebeobachtung im Schwarzwald.** Diagr., ills. *Zeitschr. für Gletscherkunde*, Vol. 10, 1916, No. 1, pp. 56-59.

MAGER, F. **Bericht über kulturgeographische Arbeiten im Herzogtum Schleswig.** *Zeitschr. Gesell. für Erdkunde zu Berlin*, 1915, No. 9, pp. 545-558.

—— **Map reading of central Europe, Everybody's aid to the, compiled with special regard to Germany.** iv and 87 pp.; index. William Clowes and Sons, Ltd., London, 1915. 6 x 4.

MEISSNER, OTTO. **Neue Reduktion der Niveaumeterablesungen des hydrostatischen Nivellements auf dem Telegraphenberge bei Potsdam.** Diagrs. *Beiträge zur Geophysik*, Vol. 14, 1915, No. 2, first part, pp. 156-186.

SCHULTE IM HOFE, A. **Die Welterzeugung von Lebensmitteln und Rohstoffen und die Versorgung Deutschlands in der Vergangenheit und Zukunft.** *Beihefte zum Tropenpflanzer*, Vol. 16, 1916, No. 1-2, pp. 1-177.

WOOD, J. Q. **Chemnitz.** *Suppl. to Commerce Repts.*, Ann. Series, 1916, No. 6c, pp. 4-11. Bur. of Foreign and Domestic Commerce, Dept. of Commerce, Washington, D. C.

RUSSIA

LETHBRIDGE, ALAN. **The new Russia: From the White Sea to the Siberian steppe.** x and 314 pp.; maps, ills., index. E. P. Dutton & Co., New York, [1915]. $5.00. 9 x 6.

There is an atmosphere of realism about Mr. Lethbridge's descriptions of Russia which makes his book at once interesting and worth reading. There are so few accounts of the Russian Empire from the point of view of its external aspect that this straightforward tale of things, places, and people seen fills a great need. The numerous photographs which the author has added to his own description are excellently chosen.

The starting point is Archangel, the port, the life of the inhabitants, and the terrible problem of forest fires in the wooded areas in that region. Next there is a visit to the island monastery of Solovetz (some 200 miles northwest of Archangel in the White Sea), one of the most extraordinary monuments to the monastic pioneer-colonizers of the Russian North. Along the White Sea littoral and back through Archangel to the Northern Dvina lies the route. From here the journey is made almost entirely by water, along the great rivers of northeastern Russia, past cities replete with huge, deserted churches, where the monks have been replaced by merchants, past alabaster cliffs and great virgin forests up into the mining districts of the Urals. Then over the Urals into the fertile farming and dairying country of Western Siberia and by water again down through the land of the Siberian cossacks to the Chinese frontier.

Mr. Lethbridge calls all this "New Russia" because it represents, with its boundless treasures of timber, mineral, and agricultural resources, Russia's economic power of the present and near future. The book is intended to develop the financial and economic interest of the English in the Russian Empire, yet the opportunities it points out should be carefully considered by Americans as well. E. K. REYNOLDS.

BACKLUND, O. **Sur la détermination des différences des longitudes Pulkovo-Paris.** *Bull. de l'Acad. Imp. des Sci.* [*de Pétrograd*], Ser. 6, 1915, No. 4, pp. 273-274. [In Russian; see also entry below under Zemcov.]

BERG, E. **Les maxima extrêmes diurnes des précipitations dans la Russie d'Europe.** Map. *Bull. de l'Acad. Imp. des Sci.* [*de Pétrograd*], Ser. 6, 1914, No. 16, pp. 1217-1234. [In Russian.]

—— **Chemin de fer de Pétrograd à la côte mourmane.** *Rev. Gén. des Sci.*, Vol. 27, 1916, No. 4, p. 104. [This topic was discussed in the Feb. *Review*, pp. 131-132.]

FEDOROV, E. **Sur la note des membres de l'Académie concernant l'étude des forces naturelles productives de la Russie.** *Bull. de l'Acad. Imp. des Sci.* [*de Pétrograd*], Ser. 6, 1915, No. 16, pp. 1679-1680. [In Russian.]

GALITZIN, BORIS. **Sur le tremblement de terre du 18 février 1911.** *Bull. de l'Acad. Imp. des Sci.* [*de Pétrograd*], Ser. 6, 1915, No. 10, pp. 991-998. [In Russian.]

—— **Port of the midnight sun, The.** Map. *The Independent*, Vol. 86, 1916, No. 3520, p. 274. [Catharine Harbor on the ice-free Arctic coast of Russia. See article in the February *Review*, pp. 128-132.]

PURINGTON, C. W. **The pilgrims of the Ural: On the road to Verkotur.** Ill. *London Times Russian Suppl.*, 1916, May 27, No. 20, p. 11.

RAY, J. A. **Odessa.** *Suppl. to Commerce Repts.*, Ann. Series, 1916, No. 13a, pp. 4-11. Bur. of Foreign and Domestic Commerce, Dept. of Commerce, Washington, D. C.

—— **Russia.** 53 pp. Guaranty Trust Company, New York, 1916. 7 x 5. [Informational pamphlet on Russian industries.]

STEBBING, E. P. **Forests of Russia: Immense reserves of timber.** Ills. *London Times Russian Section*, 1916, July 29, No. 22, p. 7.

VEREŠČAGIN, G. J. **Etudes sur les bassins d'eau douce situés dans les vallées des fleuves du sud-est de la Russie d'Europe.** *Bull. de l'Acad. Imp. des Sci.* [*de Pétrograd*], Ser. 6, 1915, No. 7, p. 588. [Brief note in Russian.]

VERNADSKIJ, V. I. **Sur l'étude des forces naturelles productives de la Russie.** *Bull. de l'Acad. Imp. des Sci.* [*de Pétrograd*], Ser. 6, 1915, No. 8, pp. 679-700. [In Russian.]

WINSHIP, NORTH. **Petrograd.** *Suppl. to Commerce Repts.*, Ann. Series, 1916, No. 13a, pp. 1-4. Bur. of Foreign and Domestic Commerce, Dept. of Commerce, Washington, D. C.

ZEMCOV, B. **Détermination des différences des longitudes Pulkovo-Paris.** *Bull. de l'Acad. Imp. des Sci.* [*de Pétrograd*], Ser. 6, 1915, No. 4, pp. 275-276. [In Russian; see also entry above under Backlund.]

ASIA

MANCHURIA, KOREA, JAPAN

—— **Forest Exploitation, Japan (Formosa).** *Board of Trade Journ.*, Vol. 93, 1916, May 18, p. 471. [Exports from the Mount Ari forests, opened three years ago, now amount to 3,000,000 cubic feet per annum. Recent exploration has revealed two similar timber resources situated respectively on the slopes of Mounts Hassen and Sansei. Together the newly discovered forests cover about double the area of those of Arisan, and they offer superior conditions for lumbering operations. Whereas the exploitation of the older forest necessitated construction of a 41-mile railroad up the mountain, the streams of the new areas will allow flotation of the logs to the place of shipment.]

HULBERT, H. B. **Japan and isothermal empire.** *Journ. of Race Development*, Vol. 6, 1916, No. 4, pp. 441-453. [By "isothermal" is meant lying in the same climatic zone, the thesis being that empires which encompassed regions strongly contrasted in climate were ephemeral.]

—— **Korea, Government General of, Annual report of the meteorological observatory of the, for the year 1914.** 188 pp. Chemulpo, 1915.

OMORI, F. **The Sakura-jima eruptions and earthquakes, II. (On the sound and ash-precipitation areas of, and on the level changes caused by, the eruptions of 1914, with historical sketches of earlier Sakura-jima outbursts.)** 180 pp.; maps, diagrs., ills., bibliogr. *Bull. of the Imperial Earthquake Investigation Committee*, Vol. 8, 1916, No. 2. [The intensity of the earthquakes and volcanic outbursts of Japan, and the accompanying loss of life, have led in recent years to a detailed study of these phenomena. This report has highly interesting chapters on related effects, as follows: Meteorological conditions at the time of the eruption of 1914; Propagation of sound waves which accompanied the Sakura-jima outbursts of 1914; Abnormal changes in height of water of Kagoshima Bay due to the Sakura-jima eruption of 1914; Level change and horizontal displacement of the ground caused by the Sakura-jima eruption of 1914. The maps and graphs are high-grade in every respect. The rise of the ground in a number of instances coincident with volcanic activity is concluded to be the result of upward pressure of injected magma, and the fall of the ground to the loss of the extruded material.]

SCIDMORE, G. H. **Japan.** 8 pp. *Suppl. to Commerce Repts.*, Ann. Series, 1916, No. 55a. Bur. of Foreign and Domestic Commerce, Dept. of Commerce, Washington, D. C.

WATARAI, TOSHIHARU. **Nationalization of railways in Japan.** 156 pp.; map, bibliogr. *Columbia Univ. Stud. in Hist., Econ. and Public Law*, Vol. 63, 1915, No. 2. $1.25. 10 x 6½.

CHINA

HARDING, GARDNER L. **Present-day China: A narrative of a nation's advance.** 250 pp.; ills. Century Co., New York, 1916. $1. 7 x 4½.

The history and problems of republican China, its hopes and achievements, are

summed up in true journalistic style in this small volume. It is the author's conviction that the republican movement is no mere flash in the pan, but that the time has come when the Chinese are beginning to think for themselves. This optimistic view imparts its bright coloring to the sketches, which portray an enormous and sluggish mass of illiterate beings upon whom Western ideas of self-government are suddenly thrust. And yet one has only to read between the lines to realize that the Chinese revolution had little meaning to the natives and that the short-lived republicanism of their country was the work of a small band of inspired idealists who had practically no community of aims or thoughts with their countrymen. It is to be regretted that hardly any reference is made to the part played by American influences in these Chinese changes.

The topic of foreign covetousness is of course discussed by Mr. Harding. Japan's growing control and the dealings of European powers form the theme of his last chapters. Although the alien activity is presented as political, one cannot help feeling that a sketch of its economic background would have enlightened the reader more effectively. In this field the railway question alone is taken up.

—— **China, Report on the foreign trade of: Abstract of statistics.** 93 pp. *China Maritime Customs Statist. Series Nos. 3 and 4 (Returns of Trade and Trade Repts.)*, 1915, Part 1. Shanghai, 1916.

—— **Port trade statistics and reports: Central ports (Shanghai to Wenchow).** pp. 727-930. *China Maritime Customs Statist. Series Nos. 3 and 4 (Returns of Trade and Trade Repts.)*, 1915, Part 2, Vol. 3. Shanghai, 1916.

—— **Port trade statistics and reports: Northern ports (Aigun to Kiaochow).** 407 pp.; map, diagr. *China Maritime Customs Statist. Series Nos. 3 and 4 (Returns of Trade and Trade Repts.)*, 1915, Part 2, Vol. 1. Shanghai, 1916.

—— **Port trade statistics and reports: Yangtze ports (Chungking to Chinkiang).** pp. 409-726. *China Maritime Customs Statist. Series Nos. 3 and 4 (Returns of Trade and Trade Repts.)*, 1915, Part 2, Vol. 2. Shanghai, 1916.

WARD, F. K. **Glacial phenomena on the Yun-nan-Tibet frontier.** Maps, diagr., ills. *Geogr. Journ.*, Vol. 48, 1916, No. 1, pp. 55-68.

MALAY ARCHIPELAGO, INCLUDING THE PHILIPPINES

CORONAS, JOSÉ. **General weather notes.** Maps, ills. *Meteorological Bull.*, 1915, Oct., pp. 195-225. Manila Central Observatory, 1916. [The two severe typhoons of October, 1915, are described in detail.]

FORTGENS, J. **Vier weken zendingsarbeid op Taliabo.** Ills. *Mededeel. Nederland. Zendelinggenoot.*, Vol. 60, 1916, No. 1, pp. 49-74. [Missionary trip in the island of Taliabu east of Celebes.]

KONINGSBERGER, J. C. **Java, zoölogisch en biologisch.** Aflevering 11-12 (= pp. 493-663). Drukkerij Dep. v. L. N. en H., Buitenzorg, 1915. Fl. 2. 9½ x 7. [Final instalment of work.]

MASÓ, M. S. **Historia del Observatorio de Manila, fundado y dirigido por los Padres de la Misión de la Campañía de Jesús de Filipinas, 1865-1915.** 210 pp.; map, diagrs., ills., bibliogr. E. C. McCullough & Co., Manila, 1915. 10½ x 7. [Founded by the private enterprise of the Jesuit fathers, the observatory, though subsidized in turn by the successive Spanish and American governments, has remained under the skilled directorship of the order. Location in the center of origin of the Pacific cyclones confers exceptional value on the work of the station.]

MAYER, A. G. **Java, the exploited island.** *Scientific Monthly*, Vol. 2, 1916, No. 4, pp. 350-354.

—— **Meteorological observations made at the secondary stations during the calendar year 1913.** 331 pp. *Ann. Rept. of the Weather Bureau [of the Philippine Is.]*, Part. 3. Manila, 1915.

MOSES, BERNARD. **Early days in the Philippines and the problem of the friar lands.** *Rept. of the 33rd Ann. Lake Mohonk Conference on the Indian and Other Dependent Peoples, Oct. 20, 21, and 22, 1915*, pp. 87-90.

—— **Philippine Islands.** 7 pp. *Suppl. to Commerce Repts.*, Ann. Series, 1916, No. 80a. Bur. of Foreign and Domestic Commerce, Dept. of Commerce, Washington, D. C.

—— **Philippine Islands, foreign commerce of the, Annual report of the Bureau of Customs and of, for the year ended December 31, 1915.** 199 pp.; diagrs., index. Bur. of Customs, Dept. of Finance and Justice, Manila, 1916.

—— **Philippine Islands, Foreign commerce of the, January-December, 1914, July-December, 1913.** 164 pp.; diagrs., index. Bur. of Customs, Dept. of Finance and Justice, Manila, 1915.

PRATT, W. E. **The occurrence of petroleum in the Philippines.** Map. *Econ. Geol.*, Vol. 11, 1916, No. 3, pp. 246-265. [The presence of petroleum in certain of the Philippine Islands became known before the close of the Spanish régime. American investigation has extended the known area of occurrence, and lately examination has been made of the product and its natural residues. Apparently the oil is similar to that obtained from beds of the same age (Miocene) and same general character in adjacent countries where it is exploited on a profitable basis. Although no definite commercial prospects can be held out, indications are such as to warrant more detailed exploration.]

RIVERS, W. C. **The Moro as a factor in the Philippine problem.** *Rept. of the 33rd Ann. Lake Mohonk Conference on the Indian and Other Dependent Peoples, Oct. 20, 21, and 22, 1915,* pp. 103-106.

TAYLOR, F. W. **Agricultural development in the Philippines.** *Rept. of the 33rd Ann. Lake Mohonk Conference on the Indian and Other Dependent Peoples, Oct. 20, 21, and 22, 1915,* pp. 90-98.

TUTHERLY, WILLIAM. **The Philippines in world politics.** *Rept. of the 33rd Ann. Lake Mohonk Conference on the Indian and Other Dependent Peoples, Oct. 20, 21, and 22, 1915,* pp. 124-133.

VAN DER HAAS, P. A. H. **Een voorstel en een paar vragen in het belang der Javasuikerindustrie.** *De Indische Gids,* Vol. 38, 1916, No. 2, pp. 149-167. [Sugar industry of Java.]

AUSTRALASIA AND OCEANIA

AUSTRALIA, NEW ZEALAND

CAMBAGE, R. H. **The mountains of eastern Australia and their effect on the native vegetation.** Map. *Journ. and Proc. Royal Soc. of New South Wales,* Vol. 48, 1914, Part 2, pp. 267-280. Sydney, 1914.

The mountain ranges of eastern Australia, averaging 3000-4000 feet in height, and from 10 to 300 miles from the coast, exercise an important influence on climate and vegetation. East of these ranges, through the effect of the mountains in causing precipitation from the easterly rain-bearing winds, the climate is moist and the characteristic type of vegetation is jungle or "brush." The conditions most essential to the development of "brush" are abundant rainfall and sufficient warmth; it is naturally excluded from the plateaus west of the dividing ranges where the climate is dry and the winters are cold. Here the prevailing type of vegetation is open forest or low scrub. Wherever gaps across the ranges too low to effect precipitation occur, the "brush" vegetation is absent and the interior types approach the coast. The flora of the plateaus includes an antarctic element which is unable to flourish in the lower coastal strip.

GEORGE E. NICHOLS.

MASSON, E. R. **An untamed territory: The Northern Territory of Australia.** xii and 181 pp.; maps, ills. Macmillan & Co., Ltd., London, 1915. $2.00. 8 x 5½.

Simplicity and spontaneity of style and well-balanced observation create in this unpretentious narrative an admirable picture of life in the least-known section of Australia. In this region, where human affairs are little complicated as yet, geographic controls are easily recognized. They constitute the background of the narrative from the beginning, where one is immediately transported to the erstwhile "hopeless, unwanted land." "It is part of Australia, and yet utterly remote from the civilized states, separated from them by a fortnight's journey by sea; it is close to the East and yet not of the East. Only five days distant there is Java, with a swarming native population, with ancient temples and other relics of a historic past; to the north lies Manila, with palm trees and plantations; and in ten days' sail—less time than it takes to reach Sydney—there is Hong Kong, the very center of the Orient." Thence against the background of nature are portrayed various aspects of Port Darwin, where mingle varied human streams—white officials, Chinese traders, Malay pearlfishers, and aborigines from the bush. Excursions farther afield bring into view coasts as far as the mouth of the Roper River in the Gulf of Carpentaria and "out bush" as far as Oenpelli, home of a pioneer settler in the buffalo-hunting country, ground now made classical through the ethnographical researches of Baldwin Spencer.

—— **Adelaide Chamber of Commerce, Sixty-sixth annual report of the.** 132 pp.; ills. Adelaide, 1916.

ASTON, B. C. **The vegetation of the Tarawera Mountain, New Zealand. Part 1: The north-west face.** Ills., bibliogr. *Journ. of Ecology*, Vol. 4, 1916, No. 1, pp. 18-26.

—— **Australia, Early knowledge of.** *Victorian Geogr. Journ.*, Vol. 32, 1916, Part 1, pp. 31-41. Victoria.

BALL, L. C. **The wolfram mines of Mount Carbine, north Queensland.** 96 pp.; map, diagrs., ills. *Geol. Survey of Queensland Publ. No. 251.* Brisbane, 1915. [With a 7-page section on physiography, water supply, and timber resources, and a contour map on the scale of 1:4,000.]

CONDLIFFE, J. B. **The external trade of New Zealand.** Diagrs. *New Zealand Official Year-Book*, Vol. 24, 1915, pp. 858-962. Wellington.

—— **Diatomite from Australia.** *Bull. of the Imperial Inst.*, Vol. 14, 1916, No. 1, pp. 41-44. [The German source of infusorial earth, or *kieselguhr*, being cut off, attention is drawn towards the Australian deposits, of which the best known occur at Lillicur, northwest of Ballarat, Victoria.]

FRASER, MALCOLM, edit. **The New Zealand official year-book, 1915.** xii and 1004 pp.; maps, diagrs., index. John Mackay, Wellington, N. Z. 1915. 8½ x 6.

GRAY, G. J. **Geological reconnaissance of Arnheim Land.** *Bull. of the Northern Territory No. 14*, pp. 20-31. Dept. of External Affairs, Melbourne, 1915. [For illustrative map, see entry under H. I. Jensen, below.]

HUNT, H. A. **Australian monthly weather report and meteorological abstract: Annual summary, 1912.** Vol. 3, No. 13, pp. 623-686. Maps. Commonwealth Bur. of Meteorol., Melbourne.

HUNT, H. A. **Temperature departures in Australia, 1915.** Ills. *Symons's Meteorol. Mag.*, No. 601, Vol. 51, 1916, pp. 4-6.

HUTCHINS, D. E. **Australian forestry.** *Trans. of the Royal Scottish Arboricultural Soc.*, Vol. 30, 1916, Part 2, pp. 123-126. Edinburgh.

JENSEN, H. I. **Report on the geology of the country between Pine Creek and Tanami.** Maps. *Bull. of the Northern Territory No. 14*, pp. 5-19. Dept. of External Affairs, Melbourne, 1915. [The number of the *Bulletin* in which this paper appears is accompanied by a general geological map of the Northern Territory, 1:1,400,000, which may also serve to illustrate this and the two other individual articles listed in this section under G. J. Gray and R. J. Winters.]

KNIBBS, G. H., edit. **Census of the Commonwealth of Australia taken for the night between the 2nd and 3rd April, 1911.** Vol. II: Parts 1-8, of the detailed tables, 1073 pp.; Vol. III: Parts 9-14 of the detailed tables, pp. 1076-2296, index. McCarron, Bird & Co., Melbourne, [1914]. 13 x 9. [Part 8 in Volume II deals with the non-European races.]

LE SOUEF, W. H. D. **Aboriginals' culinary methods and kitchen middens.** Ills. *Victorian Geogr. Journ.*, Vol. 32, 1916, Part 1, pp. 1-11. Victoria.

MACLEOD, N. J. **Statistics of the State of Queensland for the year 1914.** Part 1: **Index.** xii pp. Part 2: **Interchange.** 143 pp. Part 6: **Local government.** 22 pp. Part 8: **Vital statistics.** 13 pp. Part 9: **Production.** 66 pp. Part 10: **Summary of statistics.** 14 pp. Brisbane, 1915. [Part 2 contains trade statistics; Part 6, area and population of towns and shires.]

—— **New South Wales, Annual report of the Department of Mines, for the year 1915.** 213 pp.; maps, diagrs., index. Sydney, 1916.

OSTENFELD, C. H. **Skildringer af Vest-Australiens Natur, saerligt dets Plantevaekst.** Map, ills. *Geografisk Tidskrift*, Vol. 23, 1915-16, No. 2, pp. 35-46; No. 4, pp. 132-148. Copenhagen.

SMITH, F. H. **Australasian markets for American lumber.** 48 pp. *Bur. of Foreign and Domestic Commerce Special Agents Series No. 109.* Dept. of Commerce, Washington, D. C., 1915.

SPEIGHT, R. **The lakes of New Zealand.** *New Zealand Official Year-Book*, Vol. 24, 1915, pp. 963-969. Wellington.

TAYLOR, GRIFFITH. **Initial investigations in the upper air of Australia.** 16 pp.; maps, diagrs. *Commonwealth Bur. of Meteorol. Bull. No. 13.* Melbourne, 1916.

TWELVETREES, W. H. **Reconnaissance of country between Recherche Bay and New River, southern Tasmania.** 38 pp.; maps, diagrs., bibliogr. *Tasmania Geol. Survey Bull. No. 24.* Dept. of Mines, Hobart, 1915. [The reconnaissance was undertaken with specific reference to reported indications of petroleum occurrence. This part

of the island is practically unknown. Since the first exploration by Captain James Kelly in 1815, when landing was prevented by the natives, its inhospitable shore-line has been penetrated only by a few hunters, fishermen, and prospectors. The prospects of oil occurrence, while not negatived by the report, are not regarded favorably.]

WALLIS, B. C. **The climate of New Zealand.** Maps. *Geogr. Teacher*, No. 43, Vol. 8, 1915, Part 3, pp. 179-183.

WINTERS, R. J. **Geological observations on the country between Pine and Newcastle Waters.** *Bull. of the Northern Territory No. 14*, pp. 32-41. Dept. of External Affairs, Melbourne, 1915. [For illustrative map, see entry under H. I. Jensen, above.]

POLAR REGIONS

ANTARCTIC

MOHN, H. **Roald Amundsen's Antarctic expedition, scientific results: Meteorology.** Diagrs. Reprinted from *Videnskapsselskapets Skrifter: 1. Mat.-Naturv. Klasse*, 1915, No. 5, pp. 1-78. Christiania.

Dr. H. Mohn, author of this report on the meteorological results of Roald Amundsen's Antarctic expedition, also made the official and complete report on the meteorological work of the Nansen Arctic expedition in the *Fram*. The volume is in two parts, the first dealing with the observations at Framheim, and the second with the observations made on the sledge journey.

The essential facts regarding the meteorological conditions at Framheim are these. August is the coldest month, with —34.2° Fahr. (—36.8° C.), and December the warmest, with —23.7° (—4.6° C.). There is no regular diurnal march of temperature during the dark season. Lower temperatures are more frequent at 2 P. M. than at 8 A. M. and 8 P. M. Even in the summer season, the temperature at 2 P. M. rises only 2° to 3.5° (1° to 2° C.) above the daily mean. The absolute maximum temperature was 31.6° (—0.2° C.), and the absolute minimum —74.2° (—59° C.). The mean annual temperature was —11.2° (—24° C.). The mean annual temperature of the latitude of Framheim in the northern hemisphere is 0.7° (—17.4° C.). The prevailing wind is east, is rather wet, and seems to be essentially an incurving cyclonic wind, coming from the sea. The minimum pressure in these cases seems to be towards the north or northwest, in Ross Sea. These easterly winds are relatively mild, having a temperature 11° (6° C.) above normal, and are accompanied by snow in 56 per cent of the cases. North and northwest winds are the wettest, and the driest wind is south. Gales are not frequent, and the maximum velocity was only 20 meters per second. Northerly winds were the cloudiest, and southerly the clearest. The most frequent cloud form was stratus, followed by cirrus and altocumulus. No rain fell. Snow came only on every fifth day. The greatest probability of snow was during calms.

The sledge journey across the great ice cap to the South Pole and back again gave a surprisingly large number of meteorological observations, which are naturally of the greatest interest. The maximum actual temperature observed between Framheim and the South Pole was 23.4° (—4.8° C.), and the minimum actual temperature was —66.3° (—54.6° C.). The direction of maximum frequency of the wind on the plateau was southeast. The warmest winds were from the sea and the coldest from the interior. Southeast winds brought the greatest frequency of snowfall. Stratus, cirro-stratus, and cirrus were the cloud forms most frequently seen. Cumulus was rare. The pressure and wind directions in December, 1911, indicated that in the higher regions, above 2000 and up to 2800 meters, there were "cyclonic movements of the air, with centers in the northeast quadrant, higher temperature, and a great deal of precipitation." This confirms the view of Meinardus, that the Antarctic anticyclone exists only in the lower strata, appearing emphatically only when sea-level pressures are considered. Owing to the great cold, the vertical decrease of temperature is so rapid that above a given level the pressure over the South Polar region must be lower than over the surrounding areas. Thus a polar cyclone overlies the lower anticyclone.

R. DEC. WARD.

TAYLOR, GRIFFITH. **With Scott: The silver lining.** xiv and 464 pp.; maps, diagrs., ills., index. Dodd, Mead and Co., New York, 1916. $5.00. 9½ x 6½.

Because of the tragic fate which overtook the second expedition to the Antarctic of Captain Robert Scott, we have as yet no complete popular account such as exists for other Antarctic expeditions. "Scott's Last Expedition," which appeared in the usual two-volume form (reviewed in *Bull. Amer. Geogr. Soc.*, Vol. 46, 1914, pp. 281-285), included the diary of Captain Scott and the narrative reports of the leaders of the subordinate parties. Dr. Griffith Taylor, the geologist of the expedition and Physiog-

rapher to the Commonwealth of Victoria at Melbourne, has now supplemented these volumes by a personal narrative report, which supplies much new material that we may presume would have found a place in the report of the leader, had he lived to write one. To the many beautiful illustrations from photographs appearing in the earlier volumes, 67 full-page illustrations are here added of the same excellent quality.

To scientists it may perhaps appear that Doctor Taylor has introduced into the pages of his narrative some matters of rather trifling interest, though for this the excuse may be offered that such a volume is issued not primarily for men of science but for the general public and particularly for the members of the expedition and their relatives and friends. To this clientele personal touches possess an absorbing interest. The volume has been edited in the absence of the author from England by Mr. Leonard Huxley, who likewise edited the two volumes of "Scott's Last Expedition."

From a scientific standpoint the most important sections of the book are numbers III and VI, which describe the First Western Expedition (January-March, 1911) and the Granite Harbor Expedition (November, 1911, to February, 1912). Both of these expeditions were commanded by Doctor Taylor and had for their object the preparation of a map of the area west and southwest of MacMurdo Sound, of which area a rough reconnaissance map had been undertaken by Ferrar, the geologist of the first Scott expedition ("National Antarctic Expedition," Vol. I, map in cover). The preparation of this map by Taylor and his associates, though carried out under great difficulties, has supplied us with a piece of accurate cartographic work which is unique for the Antarctic regions. The area covered is more than a hundred miles in length, has an average breadth of perhaps thirty miles, and is drawn on the scale of five miles to the inch. This map was based upon theodolite measurements and plane-table sketches and has represented upon it more than a dozen newly discovered glaciers of considerable size, together with a larger number of subordinate ones, most of which have received names. Such glaciers represent various types which, because of the climatic conditions of the Antarctic continent, are in some sense peculiar to the region.

How peculiar Antarctic glacial conditions are, may perhaps be illustrated by Taylor's assertion that in a hundred miles of morainic debris which he traversed he saw but one scratched boulder. Upon the other hand his studies indicate that water streams are hardly so rare as has sometimes been supposed on the basis of earlier reports. Of special interest is Doctor Taylor's "palimpsest" theory of erosion by the modified outlet glaciers on the border of the continental ice sheet (pp. 174-175). Doctor Taylor holds that certain of the outlet glaciers are terraced as a result of the persistence of cwms (cirques) in some instances, and in others to the operation of the nivation process during a former retreat of the ice tongue up the valley. His studies of physiographic conditions within this special region have in part been treated with greater fullness in papers which appeared in the *Geographical Journal* from October to December, 1914. In confirmation of his view that cirques do not become entirely effaced when overridden by ice masses of the blanketing type, one should examine the plate at page 350 of the volume under review and compare it for additional confirmation with the map by Nordenskjöld of James Ross Island in West Antarctica (map 3, Vol. I, *Wissenschaftl. Ergebn. der schwed. Südpolar-Exp.*).

To the physiographer the scientific sections of the volume have exceptional interest because Doctor Taylor is one of the few trained physiographers who have studied with any care the borderland of either of the great continental glaciers. Of special interest to the geologist is the discovery within the Beacon sandstone of fish plates which fix this horizon with its layers of coal as in all probability of Devonian age.

WILLIAM HERBERT HOBBS.

ADAMS, CYRUS C. **The highest continent.** Maps, ills. *Amer. Review of Reviews*, Vol. 53, 1916, No. 5, pp. 600-602. [Antarctic Continent.]

ARCTOWSKI, HENRYK. **Shackleton's South Polar expedition: The value of his scientific observations.** Map, ills. *Scientific American*, 1916, June 17, pp. 636 and 645. [Referred to on p. 57 in the article on Shackleton in the July *Review*.]

D[INES], J. S. **Seesaw of pressure, temperature, and wind velocity between Weddell Sea and Ross Sea.** By R. C. Mossman. *Monthly Weather Rev.*, Vol. 44, 1916, No. 3, p. 113. [Reprinted from *Science Abstracts*, Sect. A, Jan. 21, 1916. Reviewed in the April *Review*, pp. 323-324.]

PIRIE, J. H. H. **Glaciology of the South Orkneys (Scottish National Antarctic Expedition).** Map, diagrs., ills., bibliogr. *Trans. Royal Soc. of Edinburgh*, Vol. 49, 1913, Part 4 (No. 15), pp. 831-863. Edinburgh. [Abstracted in the Nov. *Review*, p. 380.]

RABOT, CHARLES. **Le drame de l'expédition Shackleton dans la mer de Weddell.** Map. *La Nature*, No. 2233, 1916, July 15, pp. 37-40.

SCOTT, R. F. **The great ice barrier and the inland ice.** *Geogr. Journ.*, Vol. 46, 1915, No. 6, pp. 436-447. [Lecture delivered by Captain Scott to the members of his expedition at Cape Evans on June 7, 1911.]

—— **Shackleton Antarctic expedition.** *Scottish Geogr. Mag.*, Vol. 32, 1916, No. 5, pp. 242-247.

—— **Shackleton's, Sir Ernest, Antarctic expedition.** Map. *Nature*, No. 2432, Vol. 97, 1916, June 8, pp. 301-303.

MATHEMATICAL GEOGRAPHY

SURVEYING AND GEODESY

HOHENNER, HEINRICH. **Über die rationelle Vermessung eines Landes.** 20 pp.; diagrs., ills. E. F. Wintersche Buchdruckerei, Darmstadt, 1913. 9 x 6.

In this address, Professor Hohenner describes in simple language the methods and development of surveying from the simple measurement of the area and boundaries of the town commons to a complete national geodetic survey. The pamphlet is illustrated by plates showing simple town plats, followed by base line and triangulation development and heliotrope and high signal towers used in the French, Prussian, and United States surveys. Mathematics is entirely avoided, thus making a very readable popular exposition of the subject. JAMES GORDON STEESE.

BOWIE, WILLIAM. **Innovations in precise-leveling methods in coast survey.** Ills. *Engineering News*, Vol. 76, 1916, No. 2, pp. 74.

LANE, A. C. **On certain resemblances between the earth and a butternut.** Diagr. *Scientific Monthly*, Vol. 1, 1915, No. 2, pp. 132-139.

—— **Metro manual: A hand book for engineers, containing technical information regarding the construction, adjustment, and use of transits, tachymeters, theodolites, alidades, levels, etc.** xl and 199 pp.; diagrs., ills., index. Bausch & Lomb Optical Co., Rochester, N. Y., 1915. 7 x 4½. [Concise and handy. Constitutes the ninth enlarged and revised edition of Saegmuller's "Vest Pocket Handbook."]

REEVES, E. A. **Night marching by stars.** Diagrs. *Geogr. Journ.*, Vol. 47, 1916, No. 6, pp. 440-455.

RODEN, E. K. **Method of calculating the intersection point of St.Hilaire position lines.** Diagrs. *U. S. Naval Inst. Proc.*, No. 162, Vol. 42, 1916, pp. 481-491.

ROJI, D. A. **La legua marina de Don Jorge Juan.** *Rev. Gen. de Marina*, Vol. 78, 1916, No. 6, pp. 751-765. Madrid. [Discussion of the length of the league as determined from the measurement of a meridional arc by the French Academy of Sciences expedition to Ecuador in the early eighteenth century.]

UTTMARK, F. E. **A new system of navigation and nautical astronomy.** Diagrs. *Scientific American Suppl.*, No. 2111, Vol. 81, 1916, June 17, pp. 396-398.

PHYSICAL GEOGRAPHY

GEOPHYSICS

BAUER, L. A. **Solar radiation and terrestrial magnetism.** *Terrestr. Magnet. and Atmosph. Electr.*, Vol. 20, 1916, No. 4, pp. 143-158.

DIJK, G. VAN. **The magnetic character of the year 1915.** *Terrestr. Magnet. and Atmosph. Electr.*, Vol. 21, 1916, No. 3, pp. 149-150.

DUFFIELD, W. G. **Apparatus for the determination of gravity at sea.** Diagrs. *Proc. of the Royal Soc.*, No. 644, Series A, Vol. 92, 1916, pp. 505-517. London.

NICHOLS, E. H. **Investigation of atmospheric electrical variations at sunrise and sunset.** Diagrs. *Proc. of the Royal Soc.*, No. 462, Vol. 92, 1916, pp. 401-408.

SIMPSON, G. C. **Some problems of atmospheric electricity.** *Monthly Weather Rev.*, Vol. 44, 1916, No. 3, pp. 115-122. [The problems presented relate to the radioactivity theory of the ionization of oceanic air; the earth's penetrating radiation; the origin and maintenance of the earth's charge; the nature and cause of ball lightning; the nature and origin of the aurora.]

WOLFF, H. **Die Schwerkraft auf dem Meere und die Hypothese von Pratt.** Bibliogr. *Zeitschr. für Vermessungswesen*, Vol. 45, 1916, No. 1, pp. 1-22; No. 2, pp. 33-54.

GEOLOGY AND GEOMORPHOLOGY

FRIEDERICHSEN, MAX. **Moderne Methoden der Erforschung, Beschreibung und Erklärung geographischer Landschaften.** 36 pp.; diagrs. *Geogr. Bausteine No. 6.* Justus Perthes, Gotha, 1914.

This interesting essay by a well-known German geographer is essentially a comparison of the methods of the American and German schools of geography as represented in the writings of William Morris Davis and Siegfried Passarge, in which the final honors are thought by the author to lie with the German school.

Friederichsen prefaces his essay with a short biographical sketch of Professor Davis. Then follows an analysis of Davis' method of treating geographical subjects, illustrated by examples taken from the latter's "Erklärende Beschreibung der Landformen." Our critic doubts whether the method is so original as to deserve the prominence accorded it in geographical circles. In any case, the method has many faults, as Hettner and Passarge especially have pointed out. It is one-sided, for Davis treats landforms alone and pays no attention to their relation to the living world. Its terminology is bad, for, while a new terminology for a new science is both customary and necessary, Davis gives more new names than are needed and follows the doubtful procedure of designating stages of development in terms of man's life stages. The impropriety of the time-nomenclature is clearly apparent in the case of valley development, which is really dependent on the kind of rock, as shown by Hettner. The use of block diagrams by Davis' followers is regarded as dangerous, although Davis' own drawings have merit. And, finally, Davis' followers in particular have strikingly neglected to investigate the forces which produce landforms.

Friederichsen then observes that Passarge, clearly perceiving the weaknesses of Davis' method, has endeavored to direct students of landforms away from American toward less objectionable methods. A brief sketch of Passarge's life and writings is followed by an analysis of that author's "Physiologische Morphologie," in which Passarge concludes that changes in landforms seldom take place in the simple manner supposed by Davis, that Davis' scheme of landform description is a too rapid generalization based on observations insufficient in number and made with insufficient care, and that the scheme suffers from the fact that preconceived ideas unfavorably influence the observer's description of natural features. Passarge's own preference is for a series of "physiologic-morphologic" maps, showing on separate sheets: (1) topography by contours, (2) degree of slope, (3) geology, (4) resistance of rock according to hardness and jointing, (5) permeability and resistance to erosion, (6) porosity of waste cover, (7) erosion forms and types of land waste, (8) resistance of the vegetal covering. Friederichsen admits the difficulty of preparing such maps and thinks they must be restricted to very limited areas, while Davis' method may be used for broader regions if its weaknesses are avoided. But Passarge is a true geographer and does not make one-sided physiographic investigations. He makes an important step in advance of Davis when he tries to analyze an entire district, including the animal and vegetable world, and especially man and his works.

It is always interesting to see ourselves as others see us. The comparison of methods would have a higher value, however, if both Friederichsen and Passarge possessed a somewhat clearer conception of just what is, and what is not, involved in the so-called American method and particularly Professor Davis' method of landform description.

DOUGLAS W. JOHNSON.

BERG, ALFRED. **Wie unsere Erde geworden ist.** 94 pp.; diagrs., ills. Theod. Thomas Verlag, Leipzig, [1915]. 40 pf. 6 x 4½.

BLANCK, E. **Wie unsere Ackererde geworden ist.** 48 pp. Theod. Thomas Verlag, Leipzig, [1915]. 20 pf. 6 x 4½.

COBB, COLLIER. **Pocket dictionary of common rocks and rock minerals.** 2nd edit. vi and 53 pp. Dept. of Geol., Univ. of North Carolina, Chapel Hill, N. C. 1915. 7 x 5.

DAVIS, W. M. **The principles of geographical description.** Diagrs., index, bibliogr. *Annals of Assoc. Amer. Geogrs.*, Vol. 5, 1916, pp. 61-105. [The most complete exposition yet published by Professor Davis of his methods and standards of physiographic description and interpretation. The essentials of parts of the essay have been published before, but the complete argument will undoubtedly become a classic in geographic literature. The only criticism we would offer relates to excessive fulness in the details of psychologic processes and their relation to physiography. A good deal of this matter will strike the average reader as more elementary than necessary. But the *mastery* of the whole paper by a young geographer will place him on one of the two main roads of the science.]

HARBOE, E. G. **Jordklodens Undersøgelse med Sejsmograf.** *Geografisk Tidskrift*, Vol. 23, 1915-16, No. 5, pp. 188-197. Copenhagen.

HECKER, O. **Bericht über die Tätigkeit des Zentralbureaus der Internationalen Seismologischen Assoziation von April 1914 bis April 1915.** *Beiträge zur Geophysik*, Vol. 14, 1915, No. 2, third part, pp. 23-27.

LÄMMERMAHR, L. **Die Höhle: Bilder vom Leben und den Wundern unter Tag.** 87 pp.; diagrs., ills. Theod. Thomas Verlag, Leipzig, [1915]. 8½ x 5½.

NAVARRO, L. F. **Estado actual del problema de la Atlantis.** Maps. *Bol. Real Soc. Geogr.*, Vol. 58, 1916, No. 2, pp. 178-212. Madrid.

SAPPER, K. **Bericht über die vulkanischen Ereignisse der Jahre 1895-1913.** *Beiträge zur Geophysik*, Vol. 14, 1915, No. 1, first part, pp. 85-97; No. 2, first part, pp. 99-155.

HUMAN GEOGRAPHY

ECONOMIC GEOGRAPHY

Production

SWAIN, G. F. **Conservation of water by storage.** xvii and 384 pp.; map, diagrs., ills., index. Yale University Press, New Haven, 1915. $3.00. 10 x 7.

This discussion of matters of broader geographic interest is one of the results of the Chester S. Lyman Lectureship Fund for maintaining a course of lectures at Yale University on the subject of water storage conservation. Professor Swain has brought out clearly the larger features of the water resources of North America, and particularly of the United States. He considers the relation of water conservation to the use and protection of other resources, and the development of water power not merely from its technical aspect, but from its bearing upon existing legal and economic problems. The chapter upon forests and stream-flow is particularly valuable in reviewing the present attitude of the public and of political organizations toward the matter. It is shown that with the same total rainfall, and with topographic and geographic conditions identical, the total run-off in the stream and its distribution through the year may vary enormously.

The author calls attention to the heated discussion as to the effect of forests upon rainfall and stream-flow and notes that at the present time it is practically agreed that the effect of forests upon rainfall is small. He concludes that, aside from exceptions and special cases, the forests improve the regularity of river-flow; further, that the erosion of mountain slopes is the principal cause of the silting up of our rivers.

"That the cutting-down of forests has been followed by the drying-up of springs is a matter of such common observation that it may be substantiated by literally hundreds of statements." "As a result of this discussion and of the experience of centuries in older countries, there is no doubt that forests, especially on steep slopes, promote the regularity of flow of streams by facilitating underground storage."

The reader is cautioned against extreme views in either direction with regard to the effect of forests. The author calls attention to the fact that the flat lands having good soil are needed for growing crops and other purposes and will be so needed as population increases, reserving for forests the steep slopes and mountain sides and other areas unsuited for crops. The forests are valuable national assets, and, independent of their crop of timber, they regulate and prevent erosion.

In the discussion of floods, two lines of procedure are indicated, (1) that of flood prevention or mitigation, and (2) that of flood protection. Under the first are those efforts which retard the discharge into the river channels by means of the construction of reservoirs, also by forestation or by cultivation; next are those for enlarging the channel or increasing the slope by dredging, providing cut-offs, or improving the carrying capacity. The use of reservoirs as a method of flood prevention is considered, and reference is made to the elaborate studies of the Pittsburgh Flood Commission.

The book is a valuable contribution to our knowledge of the subject, making accessible many geographic or hydrographic facts and conclusions buried in government documents or diffused through current literature. F. H. NEWELL.

SCHMÜLL, J. H. **Rubber en rubberhandel.** Diagr. *Tijdschr. Econ. Geogr.*, Vol. 7, 1916, No. 3, pp. 99-197.

VOORHEES, J. F. **Climatic control of cropping systems and farm operations.** *Monthly Weather Rev.*, Vol. 43, 1915, No. 12, p. 612. [Author's abstract of a paper read at the Pan American Scientific Congress in Washington, Dec. 1915-Jan. 1916.]

ERRATA

p. 26, line 2 from bottom: *for* Reconnaisance *read* Reconnaissance.

p. 75, line 22 from bottom: *for* University of Chicago *read* University of Illinois.

p. 77, line 10: *for* accerding *read* according.

p. 79, line 1 in second column: *for* Gaudalupe *read* Guadalupe.

p. 84, line 12 from bottom: *for* Micellaneous *read* Miscellaneous.

p. 158, line 21 from bottom: *for* latter *read* later.

p. 232, lines 31 and 35 from bottom: *for* O'Neil *read* O'Neill.

p. 238, line 1 of first entry from bottom: *for* Bell, F. G., *read* Bell, A. F. G.

p. 235, lines 18 and 19 from bottom: *for* United States Permanent Commission of the International Geodetic Association *read* Permanent Commission of the International Geodetic Association to represent the United States.

p. 317, line 1: *for* Comissopolos *read* Comissopulos.

p. 371, in table, sixth prefecture, under Kiushin: *for* Miyagi *read* Miyazaki.

p. 391, line 2 of fourth item: *insert* 1916 *after* Series.

Additional Errata to Vol. I

p. 145, line 10 of first item: *for* 11,014 feet *read* 1,114 feet.

p. 275, line 19: *for* P. Cordier *read* H. Cordier.

p. 374, line 4: *for* 1:100,000 *read* 1:1,000,000 *and dele sentence, lines 8-12,* The map is on the same scale .... of the area.

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